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Revision of the metallic *Lasioglossum* (*Dialictus*) of eastern North America (Hymenoptera: Halictidae: Halictini)

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Abstract

Bees in the subgenus *Lasioglossum* (*Dialictus*) are commonly collected, behaviourally diverse and taxonomically challenging. The metallic species of *Lasioglossum* (*Dialictus*) occurring east of the Mississippi River are revised. Taxonomic treatments of all 97 species are provided with complete descriptions and illustrations given for the 40 species, which have not been recently described elsewhere. Identification keys for males and females are provided.

The following eleven new species are described: *Lasioglossum* (*Dialictus*) *arantium* new species, *L.* (*D.*) *ascheri* new species, *L.* (*D.*) *batya* new species, *L.* (*D.*) *curculum* new species, *L.* (*D.*) *furunculum* new species, *L.* (*D.*) *georgeickworti* new species, *L.* (*D.*) *gotham* new species, *L.* (*D.*) *izawsum* new species, *L.* (*D.*) *katherineae* new species, *L.* (*D.*) *rozeni* new species, and *L.* (*D.*) *trigeminum* new species. *Lasioglossum ascheri*, *L. curculum*, *L. furunculum*, *L. izawsum*, and *L. rozeni* are believed to be social parasites or cleptoparasites of nest-building *L.* (*Dialictus*). *Lasioglossum* (*D.*) *smilacinae* (Robertson) is resurrected from synonymy with *L. laevissimum* (Smith). *Lasioglossum* (*D.*) *nymphaearum* (Robertson) is resurrected from synonymy with *L. albipenne* (Robertson).

Lasioglossum rufulipes (Cockerell) and *L. testaceum* (Robertson) are removed from *Evylaeus* and placed in *Dialictus*.

The following eleven new synonymies are proposed (junior subjective synonym listed second): *L.* (*D.*) *flaveriae* (Mitchell) = *Dialictus tahitensis* Mitchell; *L.* (*D.*) *leucocomum* (Lovell) = *Dialictus otsegoensis* Mitchell; *L.* (*D.*) *lionotum* (Sandhouse) = *Paralictus asteris* Mitchell; *L.* (*D.*) *longifrons* (Baker) = *L.* (*Chloralictus*) *robertsonellum* Michener; *L.* (*D.*) *nigroviride* (Graenicher) = *Evylaeus pineolensis* Mitchell; *L.* (*D.*) *simplex* (Robertson) = *Halictus* (*Chloralictus*) *malinus* Sandhouse; *L. smilacinae* (Robertson) = *Halictus zophops* Ellis, = *D. philanthanus* Mitchell; *L.* (*D.*) *testaceum* (Robertson) = *Halictus* (*Chloralictus*) *scrophulariae* Cockerell, = *Lasioglossum* (*Chloralictus*) *sandhouseae* Michener; and *L.* (*D.*) *versans* (Lovell) = *Evylaeus divergenoides* Mitchell.

Lectotypes are designated for *Halictus albipennis* Robertson (1890), *Halictus albitarsis* Cresson (1872), *Halictus cressonii* Robertson (1890), *Halictus disparilis* Cresson (1872), *Halictus hortensis* Lovell (1905), *Halictus nubilis* Lovell (1905), *Halictus pilosus leucocomus* Lovell (1908), *Halictus planatus* Lovell (1905), *Halictus stultus* Cresson (1872), *Halictus subconnexus rohweri* Ellis (1915), *Halictus tegularis* Robertson (1890), *Halictus versans* Lovell (1905), and *Halictus viridatus* Lovell (1905).

Key words: Sweat bees, Halictinae, taxonomy, new species, new synonymy, lectotype, DNA barcoding

Introduction

Sweat bees (subfamily Halictinae) are infamous for being "morphologically monotonous" (Michener 1974, 2007; Packer 1997) and "the despair of taxonomists" (Wheeler 1928). *Lasioglossum* Curtis subgenus *Dialictus* Robertson, in particular, is considered one of the most taxonomically challenging groups of North American bees. *Lasioglossum* (*Dialictus*) *sensu lato* is both speciose, with approximately 250 known species in North America and 600 species globally (Ascher & Pickering 2010; see Ebmer 2002 for conflicting classification), and abundant; often accounting for the plurality or majority of individuals in bee surveys (MacKay & Knerer 1979; Kalhorn *et al*. 2003; Campbell *et al*. 2007; Ngo *et al*. in prep.).

Lasioglossum (*Dialictus*) are well known for their diverse behaviours. The subgenus includes species that may be solitary (Packer 1994), communal (Eickwort 1988), semisocial (Sakagami & Kuribayashi 1979), or eusocial (Batra 1966; Eickwort 1986), with colony sizes ranging from small (mean worker number less than 2, Packer 1992) to large (>100 workers, Michener 1966). Several species are social parasites (Wcislo 1997; Gibbs 2010b). The relatively recent origin of the subgenus (approximately 22±7 million years ago; Brady *et al*. 2006), diversity of behaviours (reviewed in Michener 1974, Yanega 1997), independent origins of brood parasitism (Gibbs 2009b), and high species richness make them ideal for studying the evolution of social behaviour and social parasitism using comparative approaches (Schwarz *et al*. 2007). Unfortunately, frequent caste differentiation, as well as sexual dimorphism, also contribute to the taxonomic challenges of this group (Mitchell 1960).

The difficulty of identifying species of *L.* (*Dialictus*) inhibits additional studies of social behaviour, biodiversity, and pollination biology. Three major taxonomic works on North American *L.* (*Dialictus*) have been published previously. Sandhouse (1924) published an early taxonomic study of *L.* (*Dialictus*) (as *Chloralictus* Robertson) but lacked a geographical focus, which limited the practical value of the associated identification keys. The *L.* (*Dialictus*) of the eastern USA were revised previously by Mitchell (1960). This revision has been frequently used (*e.g*. MacKay & Knerer 1979; Sheffield *et al*. 2003; Grixti & Packer 2006; Tuell *et al*. 2009) and greatly improved taxonomic understanding of this difficult group. Lastly, Gibbs (2010b) revised the metallic *L.* (*Dialictus*) occurring in Canada further clarifying the taxonomy of the group. Gibbs (2010b) synonymised 42 names, in addition to describing 19 new species. Most of these new species belong to the poorly studied western fauna but many of the synonymies affect eastern species. Additional valid species in the eastern USA have been described or named by Baker (1906), Cockerell (1901, 1916, 1938a), Crawford (1902a, 1904, 1906, 1932), Cresson (1872), Dalla Torre (1896), Ellis (1913), Engel (2001a), Gibbs (2009a), Graenicher (1910, 1927), Knerer and Atwood (1966a), Lovell (1905a, 1905b, 1908), Robertson (1890, 1892, 1893, 1895, 1897, 1901, 1902a, 1902b), and Smith (1853).

The subgenus *Lasioglossum* (*Dialictus*) *sensu lato* in the eastern United States includes species with the head and mesosoma in three distinct colour forms: brown to black, dull metallic, and bright iridescent. Black species were included in *Evylaeus* Robertson by Mitchell (1960). The most current phylogenetic understanding of *Lasioglossum s. l.* suggests that *Evylaeus sensu* Mitchell (1960) is paraphyletic with respect to *L.* (*Dialictus*) as well as other subgenera (Danforth 1999; Danforth *et al*. 2003). In a cladistic classification, the "acarinate *Evylaeus"* (including black North American species) is now included in *L.* (*Dialictus*) (Michener 2007, but see Ebmer 2002 for an alternative view). The dull metallic colour form is the most common in North America and these species are equivalent to *Dialictus sensu* Mitchell (1960). The colouration of the third form is similar to the bright green of *Agapostemon* and augochlorine bees in the area (Mitchell 1960). *Lasioglossum* (*D.*) *eleutherense* (Engel), is the only species of this colour form in the United States with only a

few specimens known from southern Florida (Genaro 2008). *Lasioglossum eleutherense* and other brilliant-iridescent *Dialictus*, originally classified as *Habralictellus* Moure and Hurd, occur primarily in the West Indies (Moure & Hurd 1982; Engel 2001a, Genaro 2001).

A new taxonomic study of the metallic *L*. (*Dialictus*) of the eastern North America is undertaken with keys provided to males and females. A new revision is required for this region to update the numerous changes for this fauna since Mitchell's (1960) work. Several additions to the knowledge of the *L*. (*Dialictus*) in this area were made by Mitchell (1962), Knerer and Atwood (1962a, 1962b, 1963, 1964, 1966a), and Gibbs (2009a, 2010a, 2010b). Several new species are known to occur in the eastern United States and are described herein.

Methods

This revision is part of ongoing taxonomic studies of North American *L*. (*Dialictus*), which have been undertaken by the author. The metallic species north of Mexico have been studied in detail using morphology in combination with DNA barcoding (see Gibbs 2009a, 2009b, 2010b). This integrative taxonomic approach allows for morphological assessments to be tested using an independent dataset creating a "taxonomic feedback loop" (Page *et al*. 2005). Morphological study was undertaken using Leica MS5 (Wetzlar, Germany) and Zeiss Stemi SV 6 (Oberkochen, Germany) microscopes illuminated by a white, 30 Watt fluorescent energy-saving light-bulb (equivalent to 100 Watts). This lighting system provides a diffuse light that is crucial for examining the subtle characteristics necessary for identifying *L*. (*Dialictus*). A similar system should be used in conjunction with the keys below.

Descriptions follow the style used by Gibbs (2010b). Many of the dull metallic *L*. (*Dialictus*) of eastern North America were included in this recent revision or in Gibbs (2009a) and are not described in full here but are given abbreviated taxonomic treatments. For complete taxonomic studies of these species see Gibbs (2009a, 2010b) or in the case of *L. eleutherense* see Engel (2001a). The remaining metallic *L*. (*Dialictus*) of eastern North America are each described in full. Diagnoses for all species, including those revised recently, are provided. Terminology for morphological characters follows Engel (2001b), Michener (2007), and Gibbs (2010b). Terminology for the 'propodeum' follows Gibbs (2010b), and is given additional clarification below (Fig. 1).

Metapostnotum: Equivalent to the 'propodeal triangle' but, unlike the remainder of the "propodeum", the metapostnotum is not part of the first abdominal segment (Brothers 1976).

Dorsolateral slope: Dorsally oriented portion of the propodeal surface, which forms a sloping surface between the metapostnotum and the vertical surfaces of the propodeum.

Oblique carina: Short carina located at the dorsolateral margin of the posterior vertical propodeal surface. The oblique carina is not visible in all species (Fig. 2)

Lateral carina: Vertical carina separating at least the ventral portions of the lateral and posterior surfaces of the propodeum (Fig. 2).

Terminology for surface sculpture follows Harris (1979). Examples of sculpture variation among *L*. (*Dialictus*) species are provided in figures 2–4.

Puncture density is given in terms of the interspace (i) relative to puncture diameter (d) (see figure 4 for variation in puncture density among *L*. (*Dialictus*) species). Hair length is given in relative units based on the median ocellar diameter (OD). Metasomal sterna and terga, and flagellomeres are abbreviated S, T, and F, respectively, followed by the appropriate number. The following abbreviations are used throughout: upper interocular distance (UOD), lower interocular distance (LOD), interantennal (or interalveolar) distance (IAD), antennocular (or alveolocular) distance (AOD), ocellocular distance (OOD), interocellar distance (IOD), ratio of mesoscutellum and metapostnotum lengths (MMR). Measurements were taken using an ocular micrometer.

For each species treated below, sections are provided for synonymies, diagnosis, range, and comments sections are included. Ranges include a list of state and provincial records confirmed during this study. These records are not exhaustive and do not include additional state records available from other sources (*e.g*. www.DiscoverLife.org). A DNA barcode section indicates the current status and availability of DNA barcodes sequences for each species. Species not treated in recent taxonomic studies also include complete descriptions and sections for material examined and floral records. Most floral records are based on Moure and Hurd (1987) with updated taxonomy from www.usda.plants.gov. Some plant taxa cannot be confidently placed to family level and are listed under "uncertain".

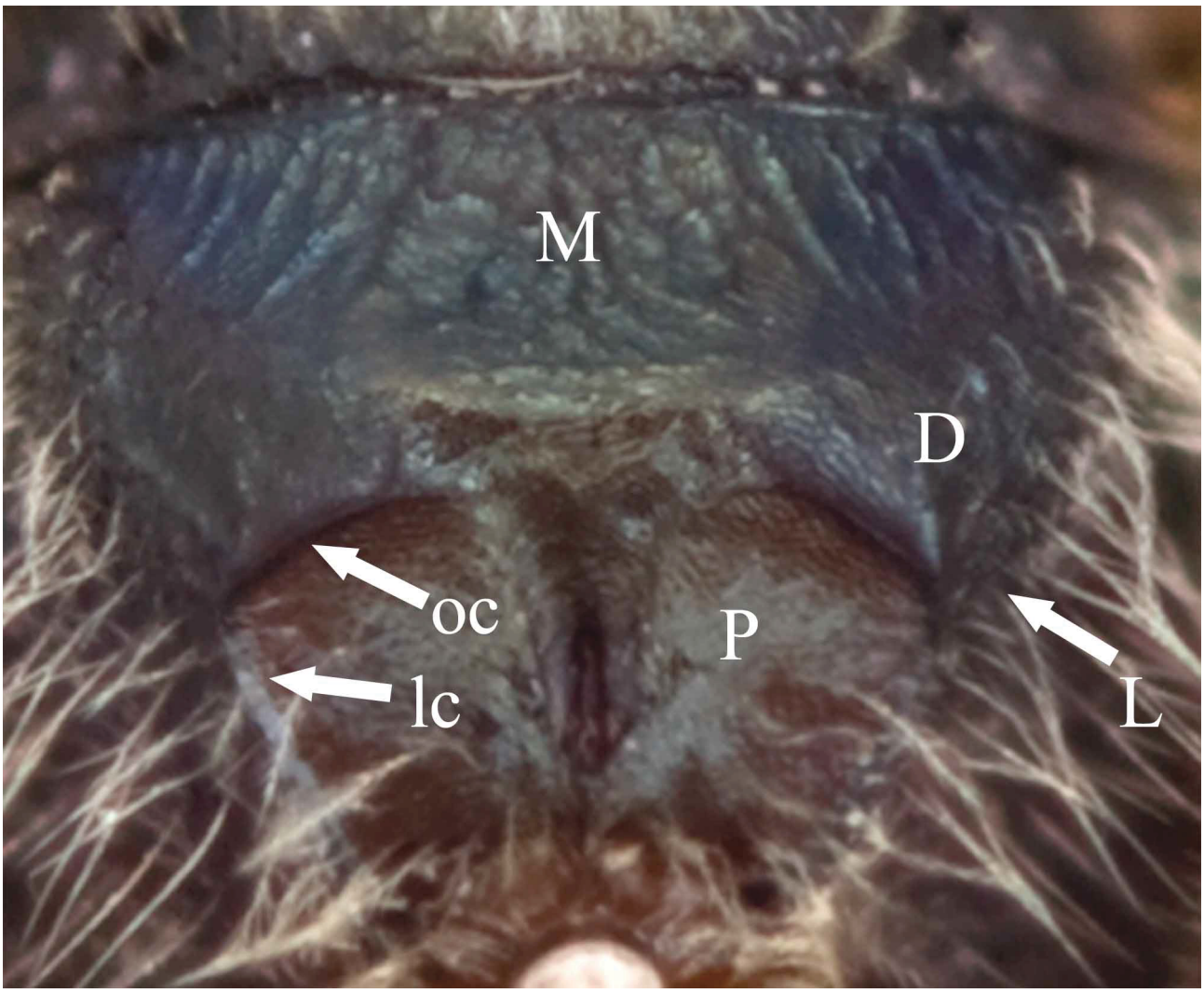

FIGURE 1. Propodeum and metapostnotum of female *Lasioglossum* with strong propodeal carinae. Metapostnotum (M). Propodeum, dorsolateral slope (D), posterior surface (P), lateral surface (L), oblique carina (oc), lateral carina (lc). (From Gibbs 2010b).

Sequencing was performed at the Canadian Centre for DNA Barcoding at the University of Guelph (Guelph, Ontario). DNA was extracted from a single dried leg (or in some cases two legs) using automated extraction protocols for 96-well plates (Ivanova *et al*. 2006). One of two "universal" primer pairs were used to amplify the DNA barcode region (LCO1490 and HCO2198; Folmer *et al*. 1994 or the variants LepF1 and LepR1; Hebert *et al*. 2004). Both sets are widely used for amplifying invertebrate samples at the Canadian Centre for DNA barcoding. The LepF1 and LepR1 are variations of the Folmer primers designed for Lepidoptera and often used for Insecta. Samples that failed to amplify were then reattempted using internal primer pairs (LepF1 and C_AntMr1DRonIIdeg_R; Smith *et al*. 2007 and LepR1/MLepF1; Hajibabaei *et al*. 2006). PCR and sequencing reactions followed standard Canadian Centre for DNA Barcoding protocols (Hajibabaei *et al*. 2005). Sequences were uploaded to the Barcode of Life Data Systems (BOLD) (Ratnasingham & Hebert 2007).

Material from the following 22 collections listed below, including acronym used in the text and curator responsible for the loans in parentheses, forms the basis of this study. Additional material has also been examined from collections listed in Gibbs (2010b). **ACNS:** Agriculture Canada, Kentville, Nova Scotia (S.K. Javorek); **ANSP**: Academy of Natural Sciences, Philadelphia, Pennsylvania (J. Weintraub); **AMNH**: American Museum of Natural History, New York, New York (J.G Rozen, Jr. and J.S. Ascher); **BMNH**: Natural History Museum, London, England (D. Notton); **CAS**: California Academy of Science, San Francisco, California (W.J. Pulawski and V. Lee); **CNC**: Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario (A. Bennett); **CTMI**: Central Texas Melittological Institute, Austin, Texas (J.L. Neff); **CUIC**: Cornell University Insect Collection, Ithaca, New York (E.R. Hoebeke and B.N. Danforth); **EMEC:** Essig Museum of Entomology, University of California, Berkeley, California (H.V. Daly); **FSCA**: Florida State Collection of Arthropods, Gainesville, Florida (L. Stange and J. Wiley); **IDNL**: Indiana Dunes National Lakeshore, Por-

ter, Indiana (R. Grundel); **INHS**: Illinois Natural History Survey, Champaign, Illinois (P.P. Tinerella); **IRCW**: University of Wisconsin–Entomology, Madison, Wisconsin (S.J. Krauth); **MCZ**: Harvard University Museum of Comparative Zoology, Cambridge, Massachusetts (P.D. Perkins); **MSUC**: Michigan State University–Entomology, East Lansing, Michigan (F. Stehn); **NCSU**: North Carolina State University Insect Collection, Raleigh, North Carolina (B. Blinn); **NMNH**: National Museum of Natural History, Washington, D.C. (D. Furth, B. Harris, and S.G. Brady); **PCYU**: Laurence Packer collection at York University, Toronto, Ontario (L. Packer). (Subsets of this material will eventually be deposited in collections managed by C. Sheffield, and the author when appropriate); **SEMC**: Snow Entomological Museum, (Kansas University Natural History Museum), Lawrence, Kansas (C.D. Michener and J.C. Thomas; **UCFC**: University of Central Florida (S.M. Fullerton and S. Kelly); **UCMC**: University of Colorado Museum of Natural History, Boulder, Colorado (V.L. Scott); **UMDE:** University of Maine–Entomology, Orono, Maine (A. Dibble); **UNSM**: University of Nebraska State Museum, Lincoln, Nebraska (B. Ratcliffe and M.J. Paulsen).

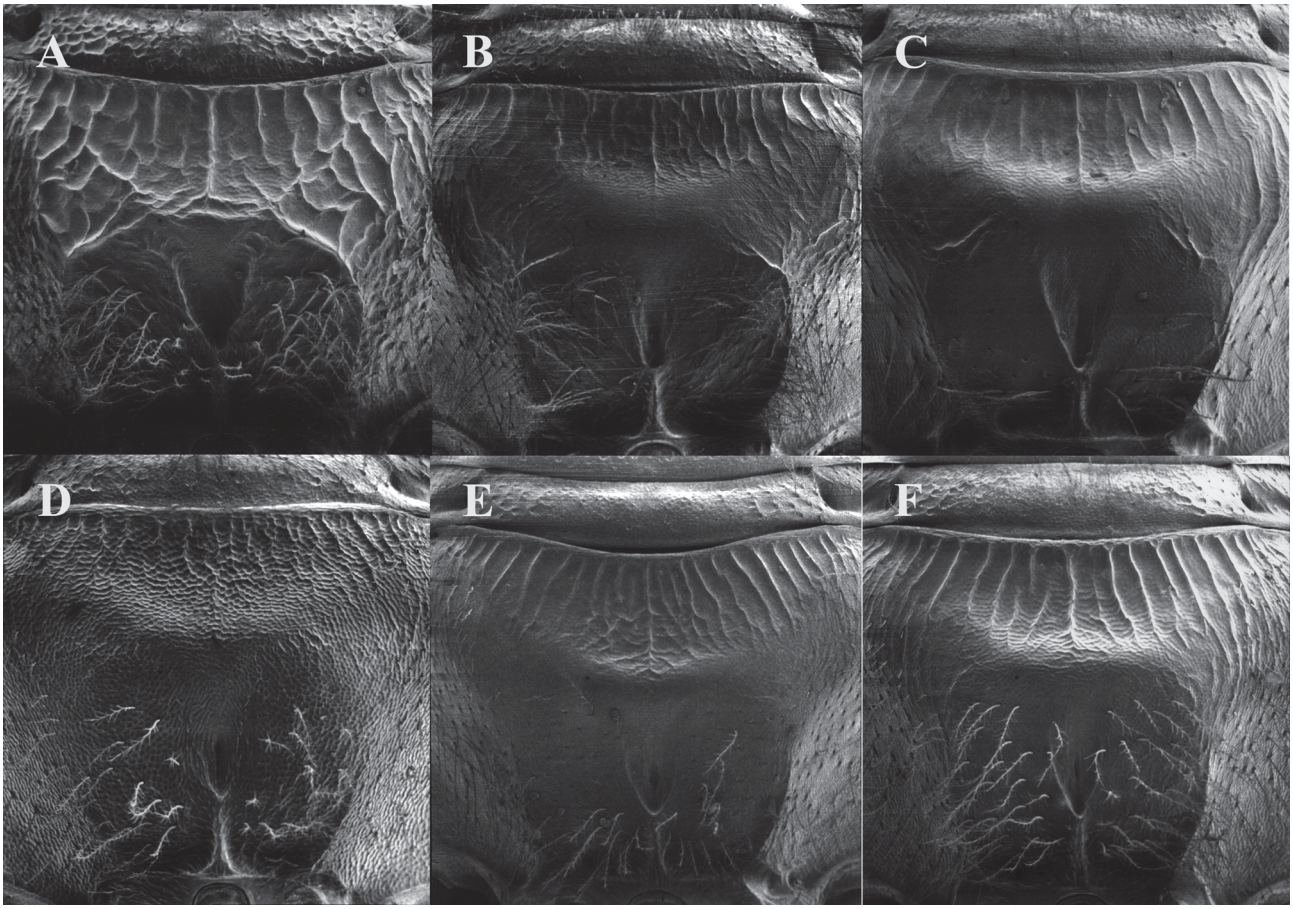

FIGURE 2. Propodeum and metapostnotum variation in female *Lasioglossum* (*Dialictus*). (A) *L. cressonii*, (B) *L. nigroviride*, (C) *L. lineatulum*, (D) *L. coreopsis*, (E) *L. connexum*, (F) *L.* (*D.*) sp.

Results

Lasioglossum Curtis subgenus *Dialictus* Robertson

Paralictus Robertson, 1901: 229.
Type species: *Halictus cephalicus* Robertson, 1892, by original designation
Dialictus Robertson, 1902a: 48.
Type species: *Halictus anomalus* Robertson, 1892, by original designation and monotypy
Chloralictus Robertson, 1902b: 248.
Type species: *Halictus cressonii* Robertson, 1890, by original designation
Halictus (*Gastrolictus*) Ducke, 1902: 102.
Type species: *Halictus osmioides* Ducke, 1902, by monotypy

Halictomorpha Schrottky, 1911: 81.

Type species: *Halictomorpha phaedra* Schrottky, 1911, by original designation

Prosopalictus Strand, 1913: 26.

Type species: *Prosopalictus micans* Strand, 1913, by original designation and monotypy

Rhynchalictus Moure, 1947: 5.

Type species: *Rhynchalictus rostratus* Moure, 1947, by original designation

Halictus (*Microhalictus*) Warncke, 1975: 85.

Type species: *Melitta minutissima* Kirby, 1802, by original designation

Halictus (*Puncthalictus*) Warncke, 1975: 87.

Type species: *Hylaeus punctatissimus* Schenk, 1853, by original designation

FIGURE 3. Gena and postgena of female *Lasioglossum* (*Dialictus*) showing sculpture variation. (A) carinulate (*L. cressonii*); (B) lineolate-imbricate (*L. coreopsis*); (C) lineolate-imbricate (*L. pilosum*); (D) weakly imbricate-polished (*L. nigroviride*).

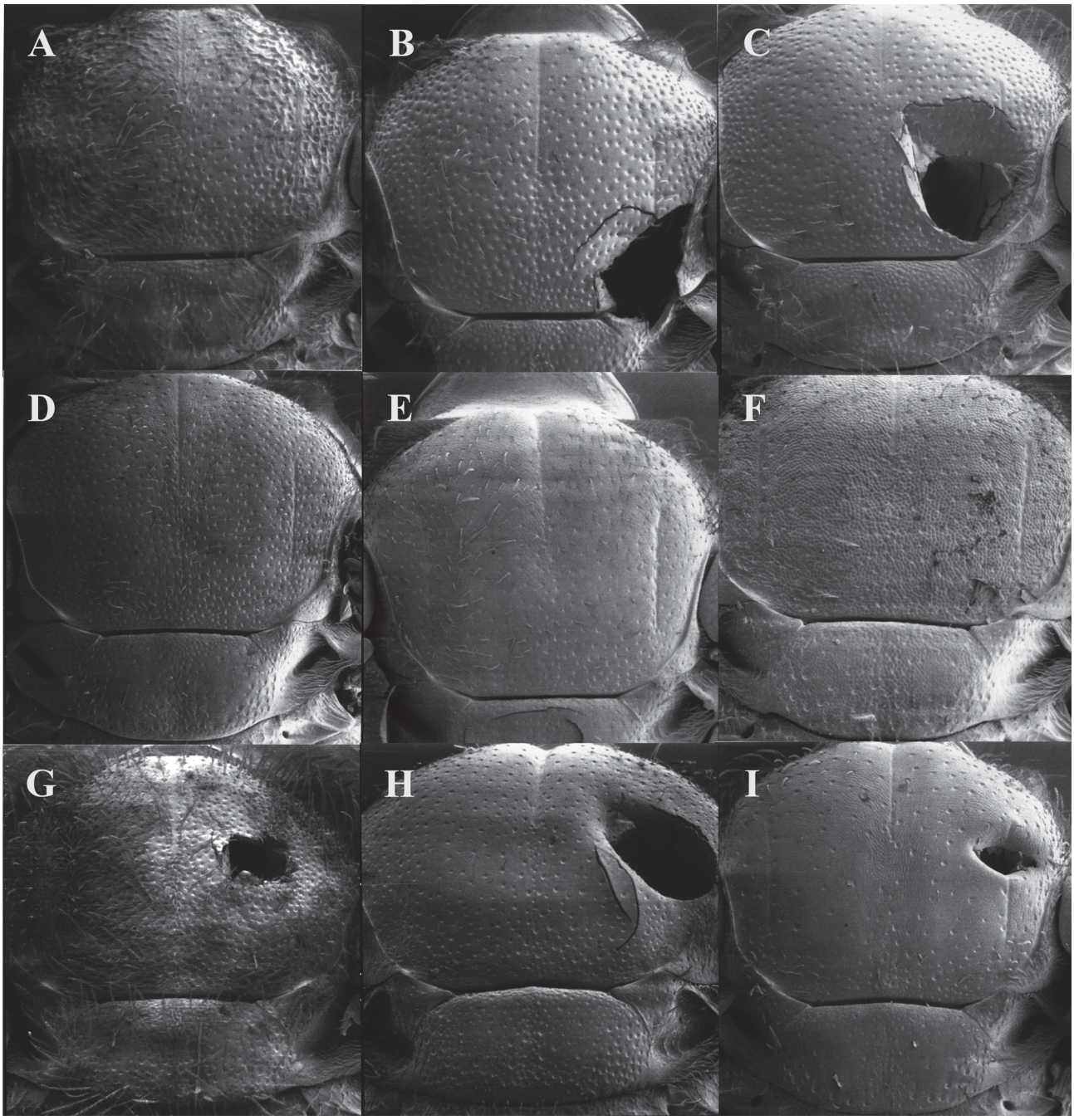

FIGURE 4. Mesoscutum of female *Lasioglossum* (*Dialictus*) showing sculpture and punctation variation. (A) *L. reticulatum*, (B) *L. cressonii*, (C), *L. nymphaearum*, (D). *L.* (*D.*) sp., (E) *L. heterognathum*, (F) *L. coreopsis*, (G) *L. pilosum*, (H) *L. nigroviride*, (I) *L. lineatulum*.

Halictus (*Rostrohalictus*) Warncke, 1975: 88.

Type species: *Halictus longirostris* Morawitz, 1876, by original designation

Halictus (*Smeathhalictus*) Warncke, 1975: 88.

Type species: *Melitta smeathmanella* Kirby, 1802, by original designation

Halictus (*Marghalictus*) Warncke, 1975: 95.

Type species: *Hylaeus marginellus* Schenk, 1853, by original designation

Halictus (*Pyghalictus*) Warncke, 1975: 103.

Type species: *Andrena pygmaea* Fabricius, 1804, by original designation

Halictus (*Pauphalictus*) Warncke, 1981: 87.

Type species: *Halictus pauperatus* Brullé, 1832, by original designation.

Habralictellus Moure & Hurd, 1982: 46.

Type species: *Halictus auratus* Ashmead, 1900, by original designation

Lasioglossum (*Afrodialictus*) Pauly, 1984: 142.
Type species: *Halictus bellulus* Vachal, 1909, by original designation
Lasioglossum (*Mediocralictus*) Pauly, 1984: 143.
Type species: *Halictus mediocris* Benoist, 1962, by original designation
Gnathalictus Moure, 2001: 493.
Type species: *Gnathalictus capitatus* Moure, 2001, by original designation
Evylaeus (*Limbevylaeus*) Pesenko, 2007: 20.
Type species: *Halictus limbellus* Morawitz,1876, by original designation
Evylaeus (*Crassevylaeus*) Pesenko, 2007: 20.
Type species: *Halictus crassepunctatus* Blüthgen, 1923, by original designation
Evylaeus (*Laevinodilaeus*) Pesenko, 2007: 20.
Type species: *Halictus laevinodis* Morawitz, 1876, by original designation
Evylaeus (*Pallidevylaeus*) Pesenko, 2007: 23.
Type species: *Nomioides pallida* Radoszkowski, 1888, by original designation
Evylaeus (*Nitidiusculaeus*) Pesenko, 2007: 24.
Type species: *Melitta nitidiuscula* Kirby, 1802, by original designation
Evylaeus (*Truncevylaeus*) Pesenko, 2007: 24.
Type species: *Halictus truncaticollis* Morawitz, 1877, by original designation
Evylaeus (*Viridihalictus*) Pesenko, 2007: 25.
Type species: *Halictus viridis* Brullé, 1840, by original designation
Evylaeus (*Glauchalictus*) Pesenko, 2007: 26.
Type species: *Halictus problematicus* Blüthgen, 1923, by original designation
Evylaeus (*Virenshalictus*) Pesenko, 2007: 26.
Type species: *Hylaeus virens* Erichson, 1835, by original designation
Evylaeus (*Loethalictus*) Pesenko, 2007: 26.
Type species: *Halictus loetus* Brullé, 1840, by original designation
Evylaeus (*Aerathalictus*) Pesenko, 2007: 27.
Type species: *Melitta aerata* Kirby, 1802, by original designation

The older names *Hemihalictus* (Cockerell 1897) and *Sudila* (Cameron 1898) should be considered subjective senior synonyms of *Dialictus* in the broad sense used here, based on molecular phylogenetic evidence, morphology, and a cladistic classification (Danforth *et al*. 2003; Michener 2007; Gibbs *et al*. 2009). An application to give precedence to *Dialictus* before these older names whenever they are considered to be synonyms is before the International Commission on Zoological Nomenclature (Gibbs *et al*. 2009). Until a decision is reached by the Commission standard usage of *Dialictus* is retained in accordance with Article 82.1 of the Code (ICZN 1999).

Diagnosis for *Lasioglossum* (*Dialictus*) in eastern North America

Lasioglossum (*Dialictus*) are small (3.1–8.1 mm), andreniform bees, which can be separated from most other bees in eastern North America by the following combination of characters: basal vein strongly arched, distal veins of forewing weak (1rs-m, 2rs-m, 2m-cu, and the distal abscissa of M; 1rs-m sometimes absent) (Fig. 5), and female inner metatibial spur pectinate with long branches.

Most species of *L*. (*Dialictus*) have metallic reflections of the head and mesosoma that distinguishes them from all other *Lasioglossum s*. *l*. in eastern North America. Additional characters that further assist in distinguishing *Dialictus* from other eastern North American *Lasioglossum* subgenera are as follows. *Lasioglossum s*. *s*. and *L.* (*Leuchalictus*) have vein 1rs-m strong and are typically much larger than *Dialictus*. Female *L.* (*Hemihalictus*) have a serrate inner metatibial spur and both sexes usually lack vein 1rs-m. Female *L.* (*Sphecodogastra*) have a unique metafemoral scopa consisting of a single linear series of coarse hairs.

The subgenus *L.* (*Evylaeus*) is the most difficult to distinguish from *L*. (*Dialictus*) with black integument. Female *Evylaeus* may have the inner metatibial spur serrate, denticulate, or pectinate but the branches are usually shorter than those of *Dialictus*. Male *Evylaeus* have the inner dorsal margins of the gonocoxites parallel basally for over 1/2 to 2/3 their length and are widely divergent apically. *Lasioglossum* (*Evylaeus*) in eastern North America usually have lateral and posterior surfaces of propodeum completely separated by lateral propodeal carinae and mesepisternum rugulose.

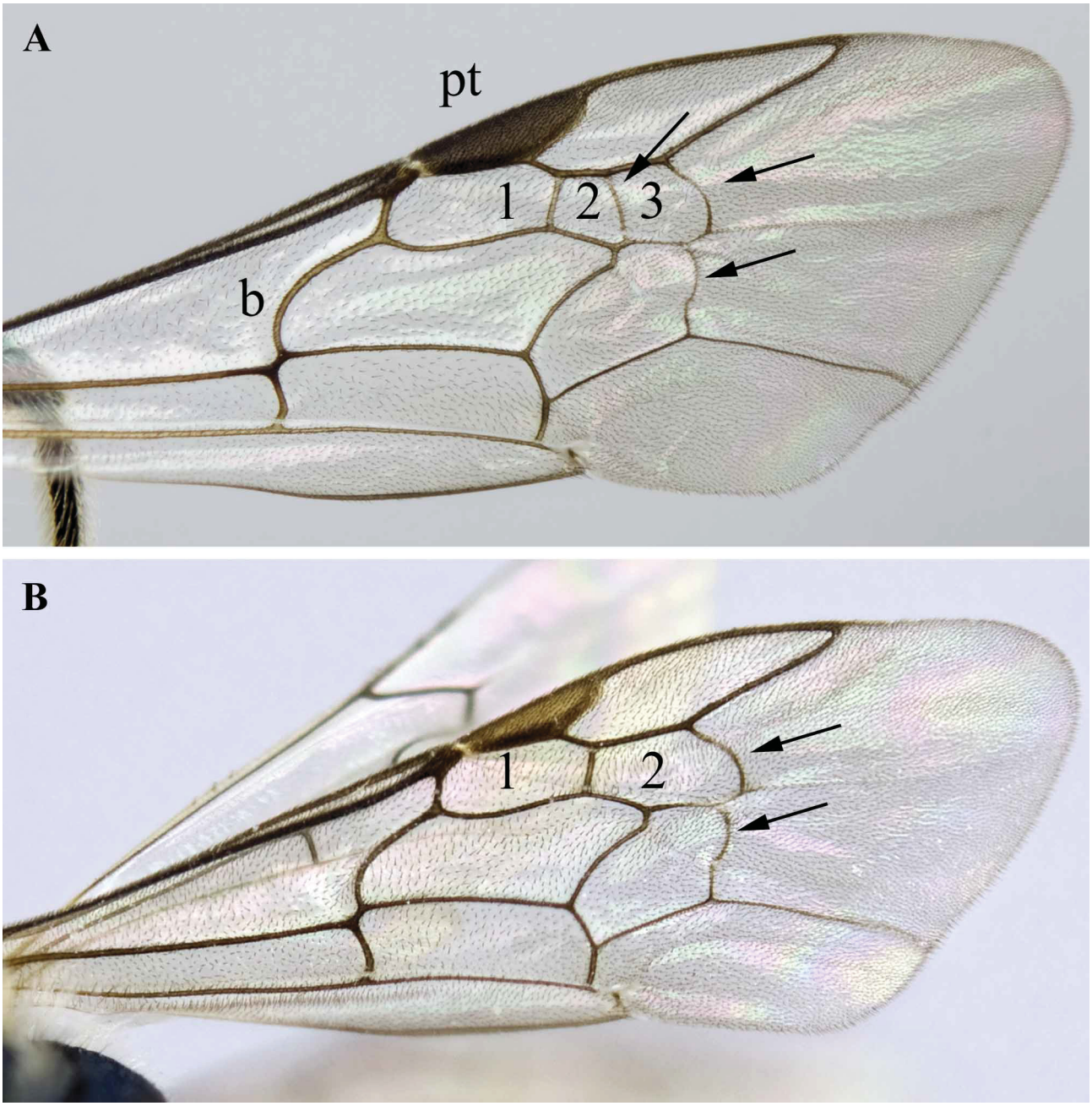

FIGURE 5. Forewings of female *Lasioglossum* subgenus *Dialictus*. (A) Typical forewing with three submarginal cells. Pterostigma (pt), basal vein (b), arrows indicate weakened veins. (B) Forewing with two submarginal cells. Arrows indicate weakened veins. (From Gibbs 2010b).

In contrast, all female *L.* (*Dialictus*) in eastern North America have pectinate inner metatibial spurs with long branches and all male *L.* (*Dialictus*) have the inner dorsal margins of the gonocoxites more evenly and weakly divergent over their entire length (except *L.* (*D.*) *rufulipes* and *L.* (*D.*) *testaceum*). Black *Dialictus* may have the mesepisternum distinctly punctate or very coarsely rugose which is never seen in eastern *Evylaeus*. Female black *Dialictus* with weak mesepisternal sculpture have lateral and posterior surfaces of propodeum incompletely separated by the lateral propodeal carinae. Species of black *Dialictus* with lateral and posterior propodeal surfaces completely separated (*e.g. L. pectorale* (Smith)) are always more coarsely sculptured on the mesosoma than *Evylaeus*.

Keys to metallic *Lasioglossum* (*Dialictus*) of eastern North America

The following keys are intended to allow identification of metallic species of *Lasioglossum* in the subgenus *Dialictus*. Several species can be found multiple times in the following keys to males and females. This is an intentional attempt to account for variation observed within species and different possible interpretations of the characters given earlier in the key. Some *L.* (*Dialictus*) are particularly difficult to identify and require examination of subtle characteristics of the surface sculpture. A lighting system, which gives a bright, diffuse light, such as that described in the Methods section, is crucial for observing these characters. The diagnoses and images provided in the species description section should provide additional confidence in identifications.

Key to sexes

1. Flagellomeres 10; inner metatibial spur pectinate; metasomal terga 6 . . . . . female
- Flagellomeres 11; inner metatibial spur serrate; metasomal terga 7 . . . . . male

Key to female metallic *Lasioglossum* (*Dialictus*) of eastern North America

1. Nest-building species; metafemur with strong scopa; labrum with apical process narrow (Fig. 6A), dorsal keel present 2
- Socially parasitic species; metafemur with scopa weak or absent; labrum with apical process wide (Fig. 6B), dorsal keel absent 99

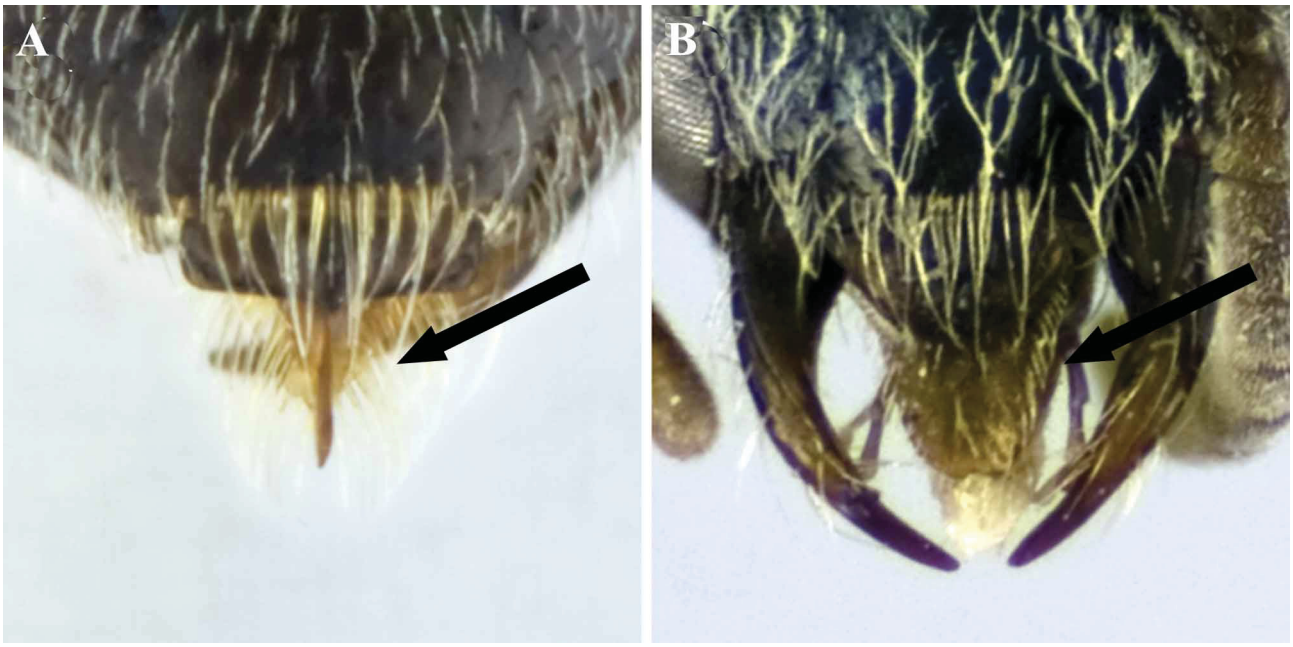

FIGURE 6. Labrum of female *Dialictus*; (A) nest-building species, (B) parasitic species. Arrows indicate apical process. (From Gibbs 2010b).

2. Metasomal terga black, brown or metallic 3
- Metasomal terga pale brownish yellow to dark red 91
3. Tegula ovoid, obscurely punctate (Fig. 7B; except distinctly punctate in *L. nymphaearum* (Robertson)) 4
- Tegula enlarged with distinct posterior angle, distinctly punctate (Fig. 7A) 86
4. Procoxa with conical projection (Fig. 8A) (propodeal dorsolateral slope with ventral margin defined by V- or U-shaped carina) . . . . . *L. illinoense* (Robertson)
- Procoxa without conical projection (Fig. 8B) (propodeal dorsolateral slope with ventral margin variable, usually without V- or U-shaped carina) 5

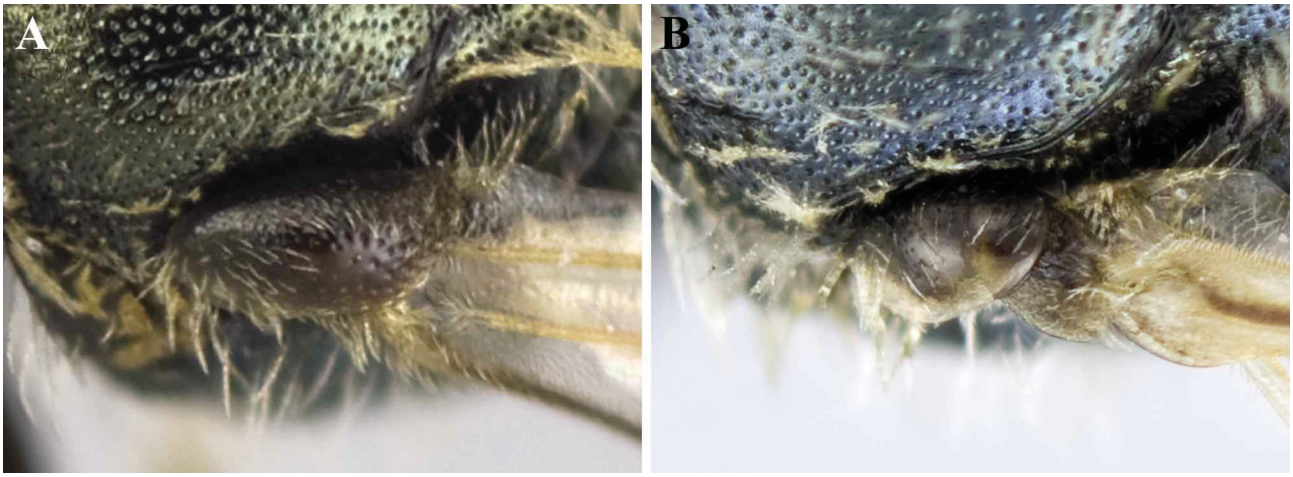

FIGURE 7. Tegula (A) punctate, enlarged, punctate with posterior angle (B) ovoid, without posterior angle (*L. nymphaearum*). (From Gibbs 2010b).

FIGURE 8. Procoxa (A) with conical projection (*L. illinoense*), (B) without conical projection (From Gibbs 2010b).

5. T1 declivitous surface with acarinarial fan of appressed hairs present, sometimes with wide dorsal/medial opening; T1 declivitous surface without erect hairs basomedially (Fig. 9A) 6
- T1 declivitous surface with acarinarial fan of appressed hairs absent; T1 declivitous surface with erect hairs basomedially (Fig. 9B) 84
6. Mesosoma coarsely sculptured (mesoscutal punctures coarse, mesepisternum coarsely rugose or reticulate, etc.) *and* propodeal lateral and posterior surfaces separated by strong lateral carina (Fig. 2A) 7
- Mesosoma without combination above (*i.e.* mesoscutal punctures fine *or* mesepisternum rugulose or punctate *or* propodeal lateral and posterior surfaces incompletely separated by lateral carina; Figs. 2C–2F) 12
7. Hypostomal carinae widely divergent towards mandible bases (Figs. 10C, 11B); mesoscutum laterad of parapsidal line reticulate-rugose (Fig. 4A) 8
- Hypostomal carinae parallel (Fig. 10A, 11A); mesoscutum laterad of parapsidal line punctate (Fig. 4B) or coarsely rugose . . . 9
8. Protrochanter with anterior surface excavated; hypostomal carinae usually strongly produced, visibly protruding in lateral view . . . . . *L. bruneri* (Crawford)
- Protrochanter without anterior surface excavated; hypostomal carinae not strongly produced, not visibly protruding in lateral view . . . . . *L. reticulatum* (Robertson)

9 (7). Mesoscutum coarsely rugose laterally (Fig. 127); pronotal ridge sharply angled . . . . . *L. hartii* (Robertson)
- Mesoscutum distinctly punctate laterally; pronotal ridge broadly rounded 10

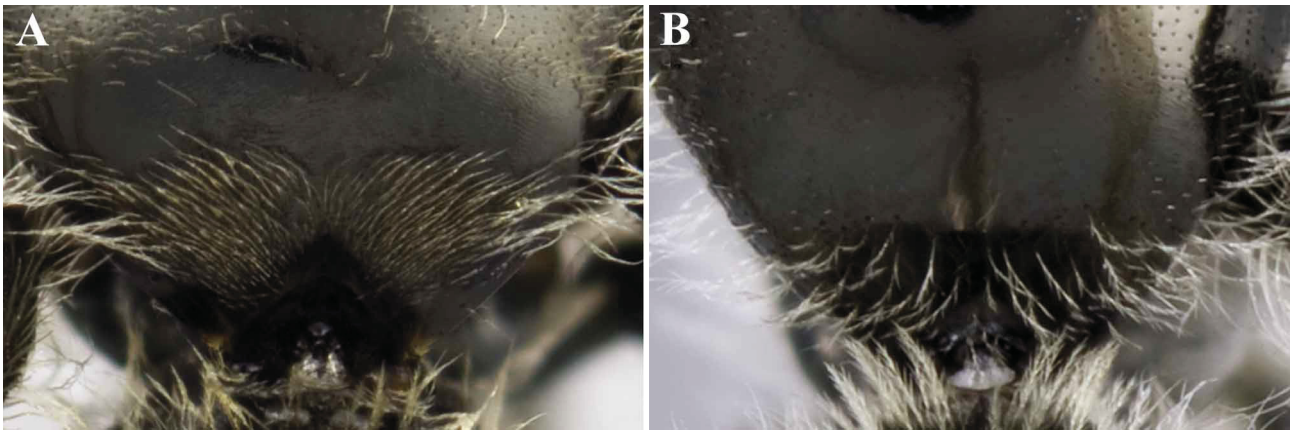

FIGURE 9. Declivitous surface of T1 with acarinarial fan (A) present, (B) absent. (From Gibbs 2010b).

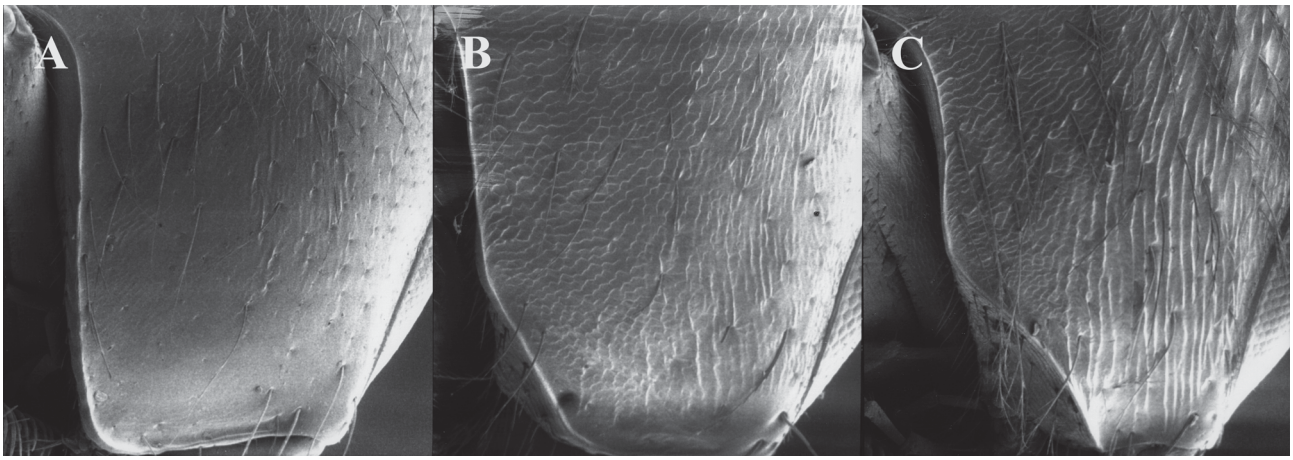

FIGURE 10. Hypostomal carina variation in female *Lasioglossum* (*Dialictus*). (A) subparallel (*L. connexum*); (B) divergent (*L. heterognathum*); (C) divergent (*L. reticulatum*).

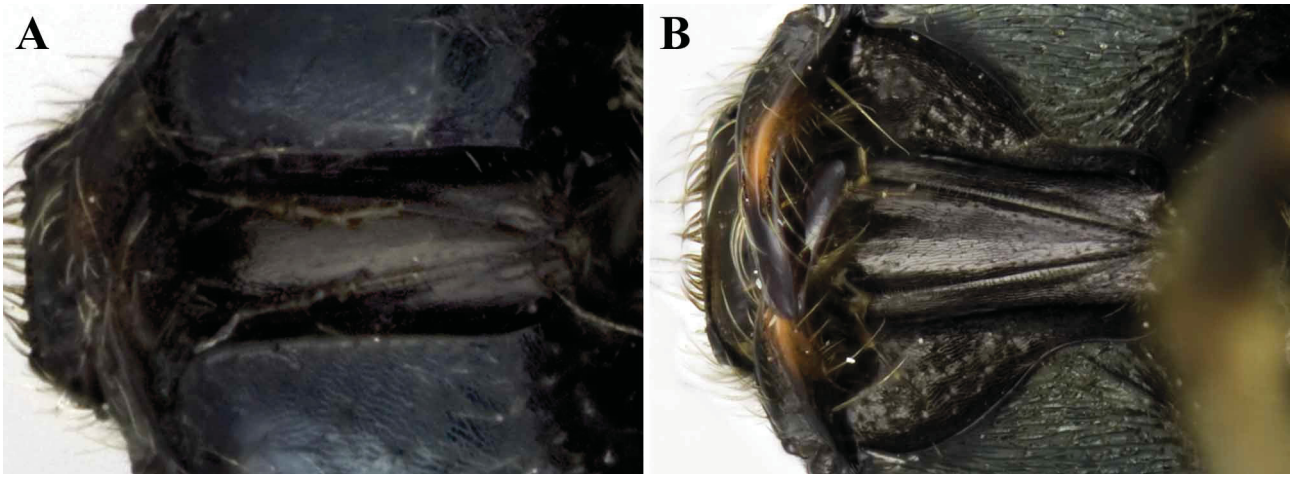

FIGURE 11. Hypostomal carinae (A) parallel, (B) divergent. (From Gibbs 2010b).

10. Transverse propodeal carina not interrupted medially; tegula distinctly punctate; hypostomal carina produced distally, protruding in lateral view . . . . . *L. nymphaearum* (Robertson)
- Transverse propodeal carina, if present, interrupted medially; tegula obscurely punctate; hypostomal carina not produced distally 11

11. Mesoscutal punctures between parapsidal lines sparse (i=1–3d); head and mesosoma usually blue; wings white with pale venation. . . . . *L. albipenne* (Robertson)
- Mesoscutal punctures between parapsidal lines relatively dense (i=1–1.5d); head and mesosoma greenish; wings faintly dusky with amber venation . . . . . *L. cressonii* (Robertson)

12 (6). Mesoscutal punctures laterad of parapsidal line dense, interspaces mostly less than 1.5 puncture diameters (i≤1.5d) (Figs. 4B–4D, 12B) 13
- Mesoscutal punctures laterad of parapsidal line sparse, interspaces mostly greater than 1.5 puncture diameters (i=1.5–3d) (Figs.4I, 12A) 77

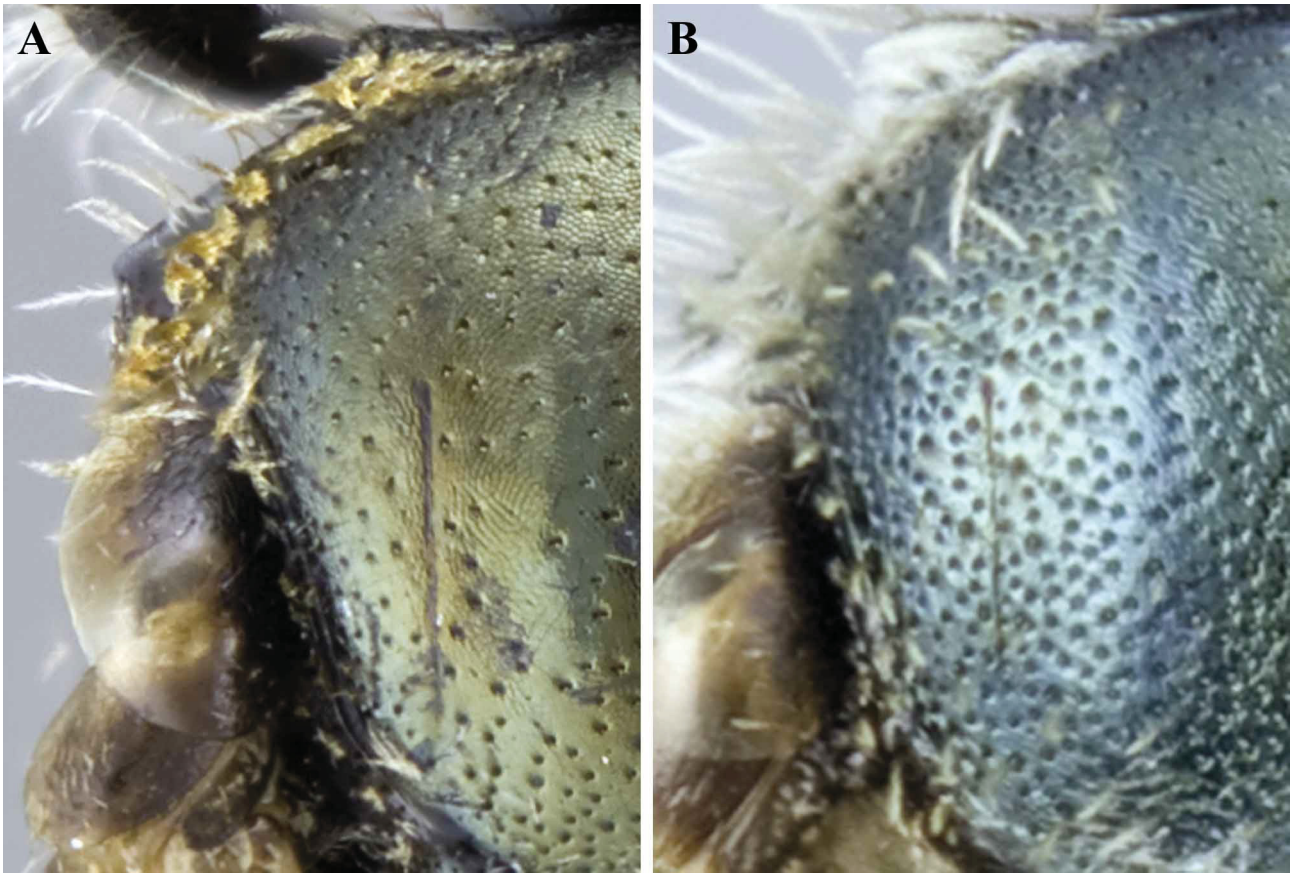

FIGURE 12. Mesoscutal punctation on lateral portion of disc (A) sparse (B) dense. (From Gibbs 2010b).

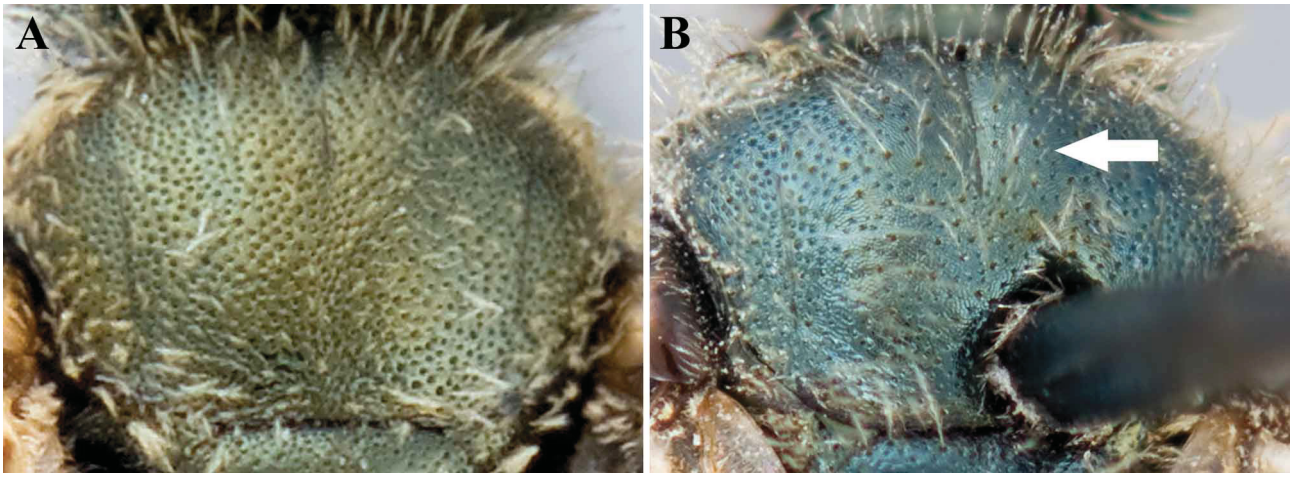

FIGURE 13. Mesoscutal punctation (A) completely dense, (B) sparse medially (indicated by arrow). (From Gibbs 2010b).

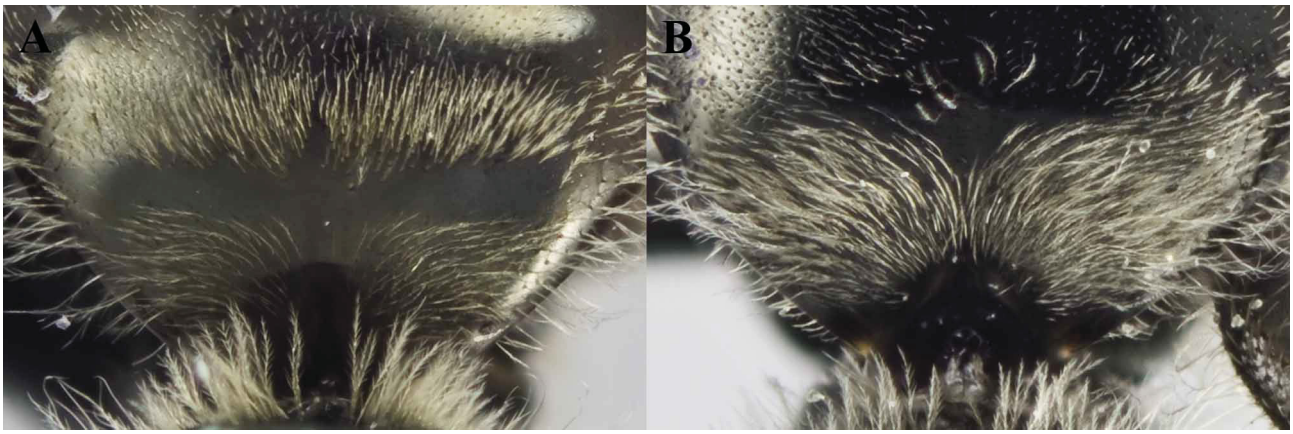

FIGURE 14. T1 Acarinarial fan (A) with transverse glabrous area (*L. disparile*); (B) without transverse glabrous area (*L. albipenne*).

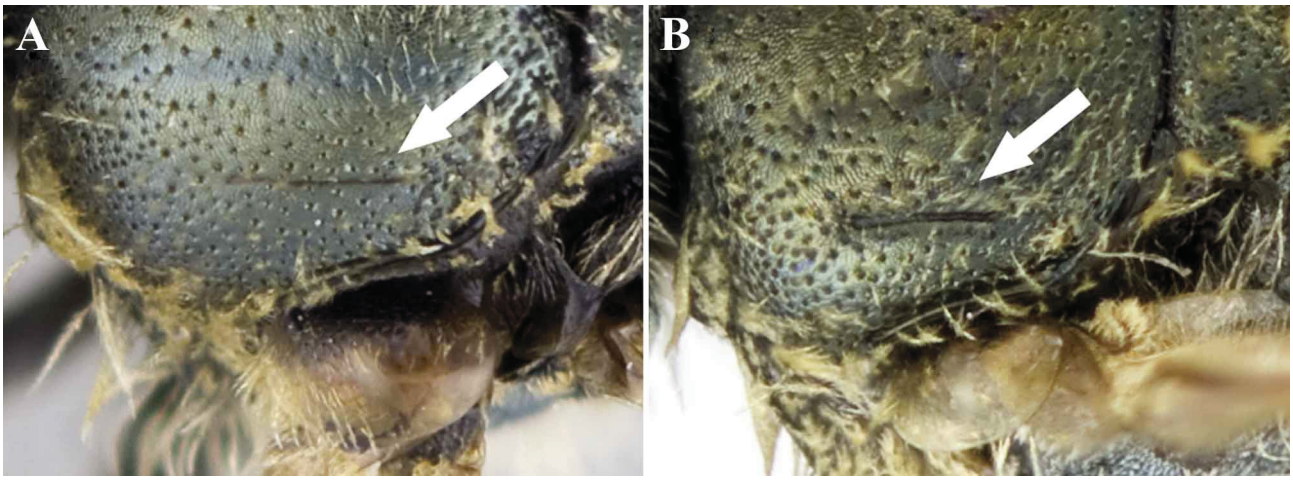

FIGURE 15. Parapsidal line of mesoscutum, indicated by arrow, (A) narrow, (B) wide (*L. foveolatum*). (From Gibbs 2010b).

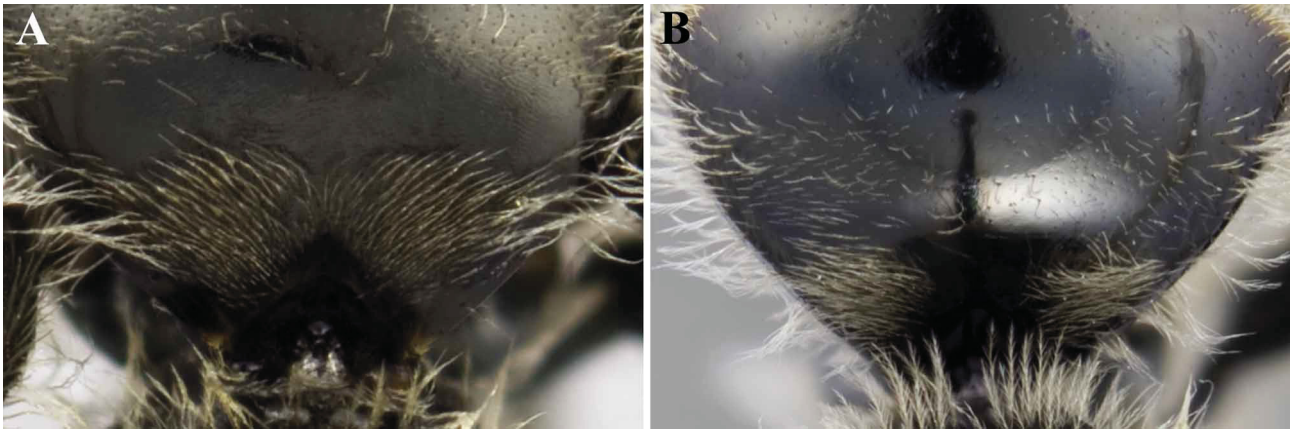

FIGURE 16. T1 acarinarial fan (A) complete, without dorsal opening, (B) incomplete, with dorsal opening. (From Gibbs 2010b).

13. Mesoscutal punctures between parapsidal lines sparse, interspaces greater than puncture diameter (i>d) (Figs. 4A–4F, 4H, 4I, 13B) 14
- Mesoscutal punctures between parapsidal lines dense, interspaces less than puncture diameter (i<d) (Figs. 4G, 13A) 68
14. T1 with distinct transverse band of appressed hairs at boundary of dorsal and declivitous surfaces, hair band separated from acarinarial fan by transverse glabrate area (Fig. 14A) . . . . . *L. disparile* (Cresson)
- T1 not as above, with, at most, scattered erect hairs at boundary of dorsal and declivitous surfaces (Fig. 14B). 15
15. Supraclypeal area greatly convex; parapsidal line broad, wider than two puncture diameters (Fig. 15B). . . . . *L. foveolatum* (Robertson)
- Supraclypeal area at most slightly convex; parapsidal line narrow, not wider than one puncture diameter (Fig. 15A). 16

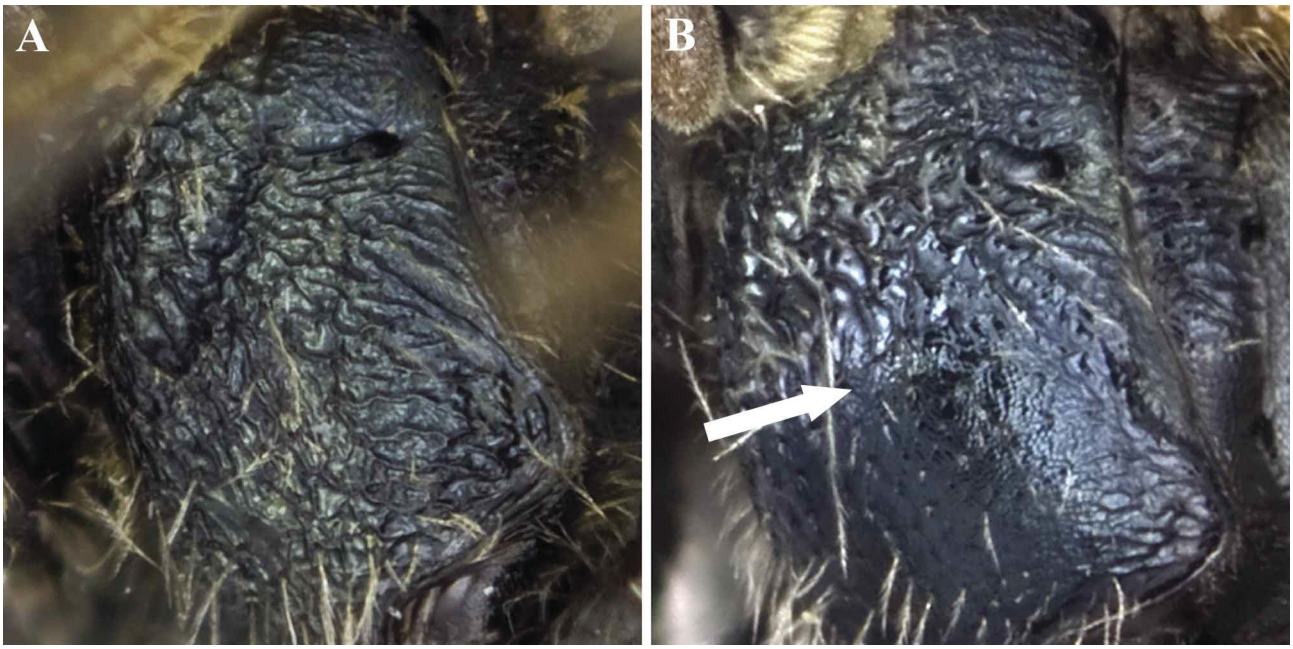

FIGURE 17. Mesepisternum (A) without distinct change in sculpture (B) with distinct change in sculpture, indicated by arrow (*L. dreisbachi*). (From Gibbs 2010b).

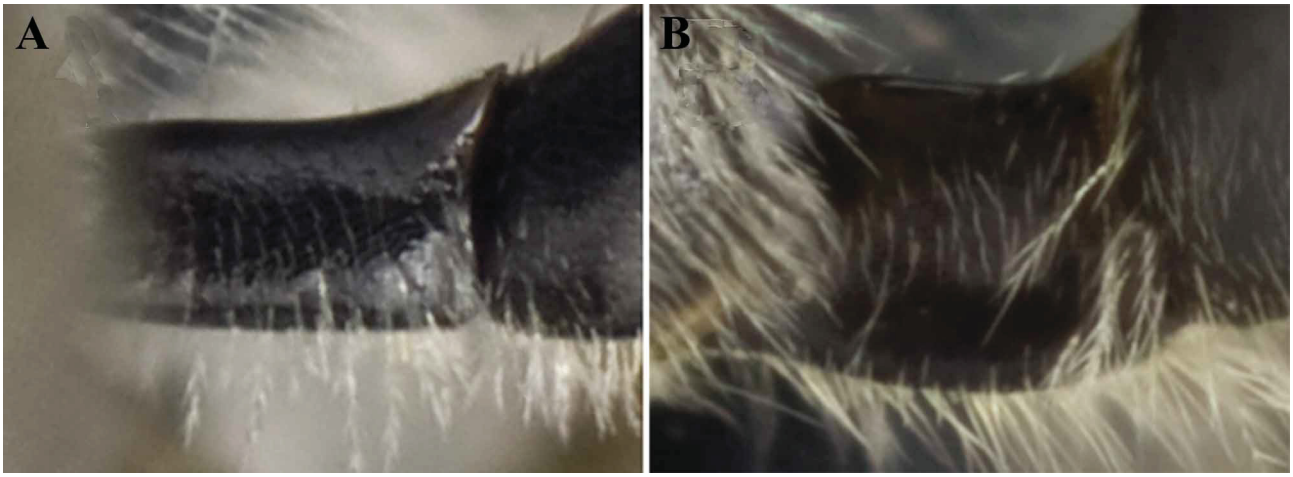

FIGURE 18. Protrochanter (A) narrow, (B) wide (female *L. callidum*). (From Gibbs 2010b).

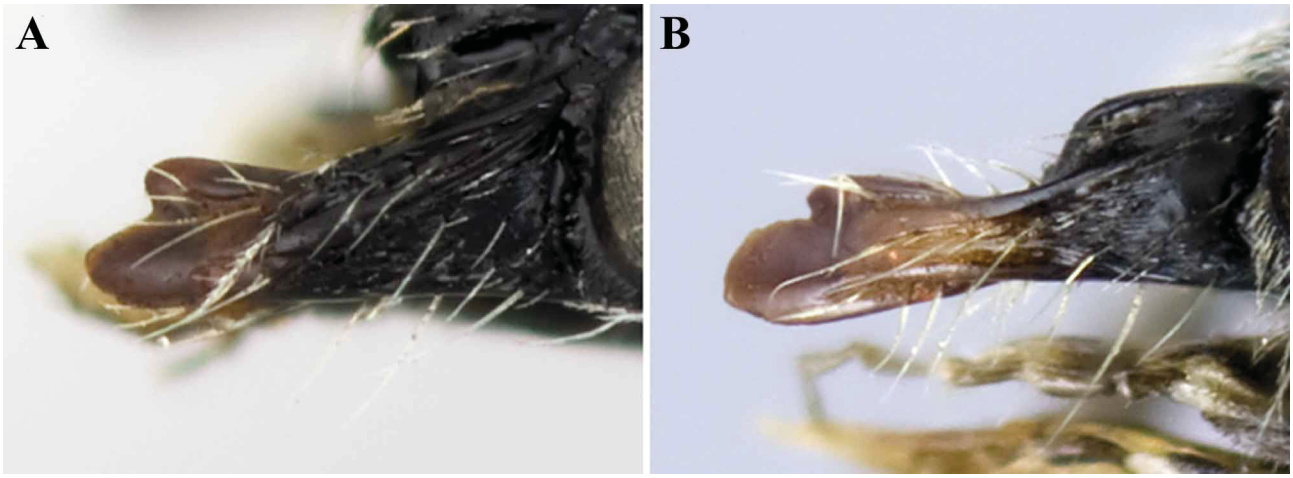

FIGURE 19. Mandible of female (A) without strongly curved dorsal margin, (B) with strongly curved dorsal margin (*L. callidum*). (From Gibbs 2010b).

16. Head round to wide (length/width ratio < 1.02); supraclypeal area usually wider than long 17
- Head elongate (length/width ratio > 1.03); supraclypeal area longer than wide. 62
17. T1 acarinarial fan incomplete, with medial opening (Fig. 16B) 18
- T1 acarinarial fan complete, without medial opening (Fig. 16A) 45
18. Mesepisternal sculpture with sharp division between coarsely rugose dorsal half and imbricate-punctate ventral half (Fig. 17B) . . . . . *L. dreisbachi* (Mitchell)
- Mesepisternal sculpture without sharp division between dorsal and ventral halves (Fig. 17A). 19
19. Protrochanter broad, width subequal to length (Fig. 18B); mandible with dorsal margin strongly curved, narrowing suddenly at midlength (Fig. 19B). . . . . *L. callidum* (Sandhouse)
- Protrochanter narrow, width approximately ½ length (Fig. 18A); mandible without dorsal margin strongly curved, narrowing gradually over total length (Fig. 19A). 20

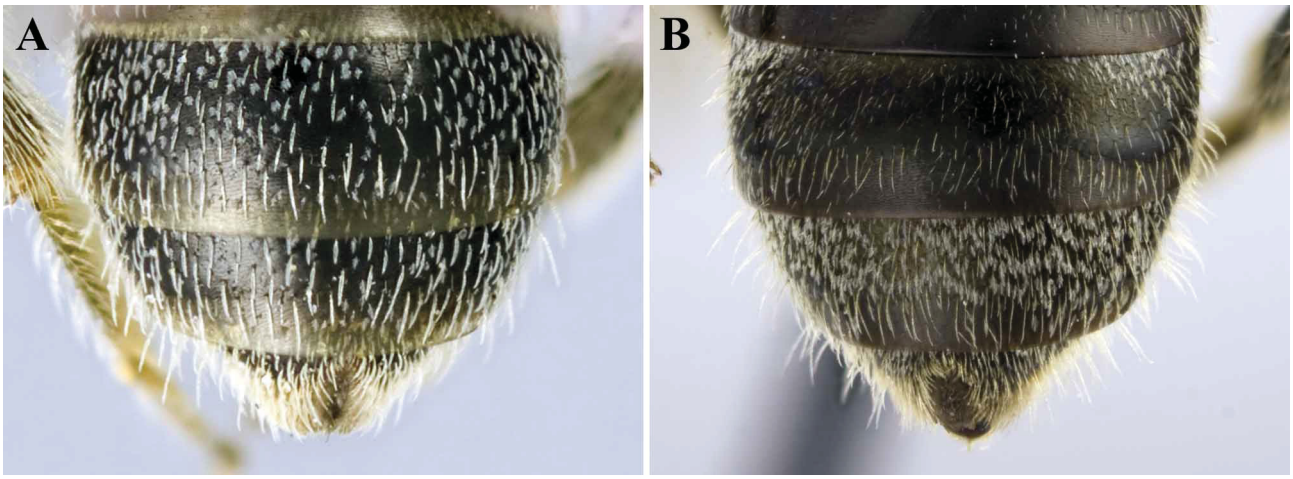

FIGURE 20. T3–T4 (A) with uniquely coarse, evenly spaced, longitudinal hairs (*L. imitatum*); (B) without coarse hairs (*L. laevissimum*). (From Gibbs 2010b).

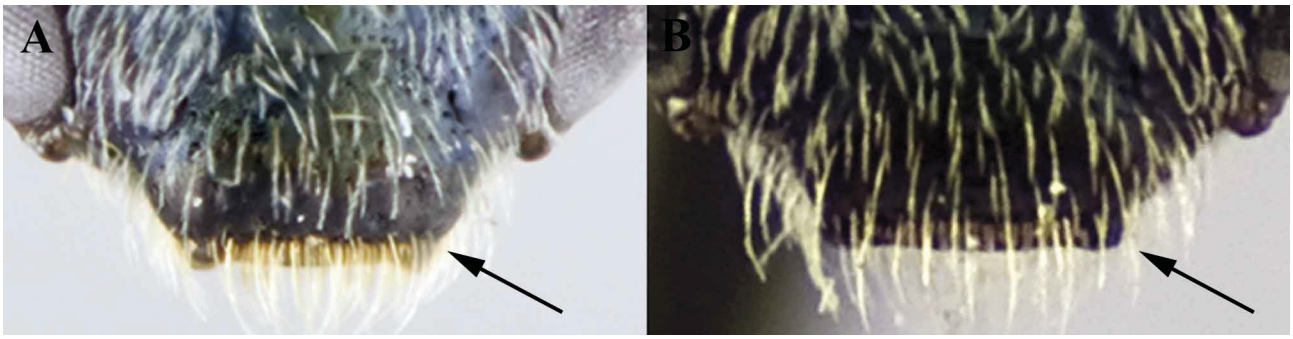

FIGURE 21. Margin of clypeus (A) *L. admirandum*, (B) *L. mitchelli*.

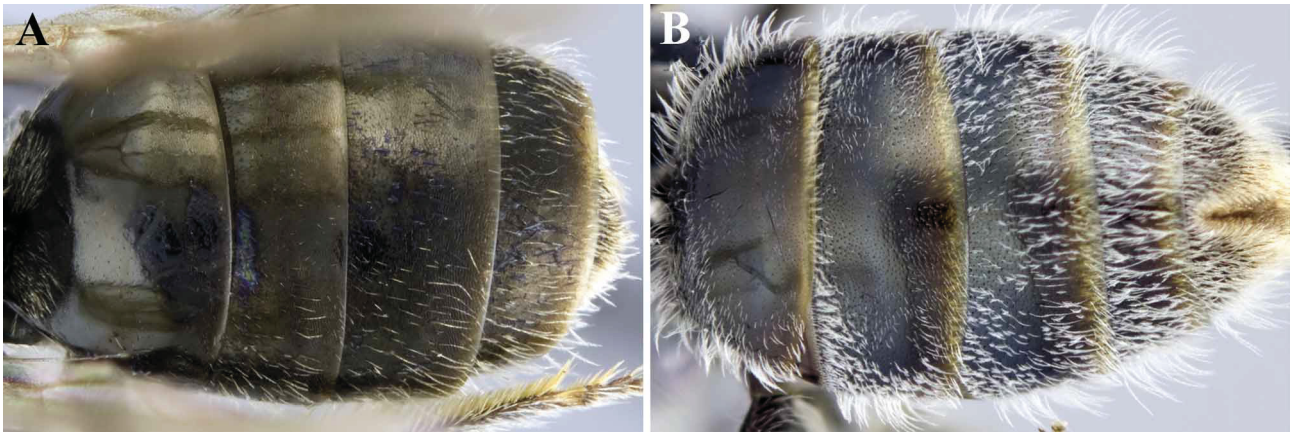

FIGURE 22. Metasomal terga (A) without basolateral tomentum or apical fringes, (B) with basolateral tomentum and apical fringes. (From Gibbs 2010b).

20. Hypostomal carinae divergent towards mandible bases (Fig. 10B); (head often wider than mesosoma) . . . . . *L. heterognathum* (Mitchell)
- Hypostomal carinae parallel (Fig. 10A); (head usually narrower than mesosoma) 21
21. T3–T4 with uniquely thick, evenly spaced, longitudinally oriented hairs (Fig. 20A); (size small) . . . . . *L. imitatum* (Smith)
- T3–T4 without thick, evenly spaced, longitudinally oriented hairs (Fig. 20B); (size variable) 22
22. Mesepisternum rugulose, tessellate or weakly punctate, posterior portion relatively unsculptured, area anterior to mesocoxa never coarsely rugoso-carinulate 23
- Mesepisternum rugose, posterior portion distinctly sculptured, area anterior to mesocoxa usually coarsely rugoso-carinulate (Fig. 17A) 44
23. Clypeus with margin distal to preapical fimbriae narrow, appearing as a continuation of the lateral margins converging below the suborbital line (*i.e.* clypeal margin with trapezoidal appearance) (Fig. 21A). 24
- Clypeus with margin distal to preapical fimbriae wide, appearing divergent from the lateral margins converging below the suborbital line (*i.e.* clypeal margin with rectangular appearance) (Fig. 21B) 42
24. T2–T4 with tomentum at least forming distinct basolateral patches; T3–T4 apical fringes present, usually dense (Fig. 22B). 25
- T2–T4 with very sparse, virtually absent tomentum, at most limited to scattered basolateral hairs, T3–T4 apical fringes absent or very sparse (Fig. 22A). 36
25. T1 anterior surface dull due to presence of distinct, transversely lineolate, microsculpture 26
- T1 anterior surface polished due to nearly complete absence of microsculpture 30
26. T1 acarinarial fan with wide dorsal/medial opening, approximately equal to width of lateral hair patches; T3 apical margin brownish yellow with distinct apical fringe 27
- T1 acarinarial fan with narrow dorsal/medial opening, much less wide than lateral hair patches; T3 apical margin dark reddish brown without distinct apical fringe 29
27. Gena wider than eye; clypeus distinctly flat . . . . . *L. apocyni* (Mitchell)
- Gena narrower than eye; clypeus slightly convex. 28
28. Mesoscutum tessellate; T3–T4 with abundant tomentum and dense apical hairs forming dense apical fringes; lower paraocular area with dense punctures (i≤d). . . . . *L. paradmirandum* (Knerer and Atwood)
- Mesoscutum weakly imbricate; T3–T4 with moderately sparse tomentum and sparse apical hairs forming sparse apical fringes; lower paraocular area with relatively sparse punctures (i=1–1.5d) . . . . . *L. fattigi* (Mitchell)

29 (26). T2 apical impressed area impunctate; gena usually subequal to eye . . . . . *L. laevissimum* (Smith) [in part]
- T2 apical impressed area punctate; gena narrower than eye . . . . . *L. gotham* Gibbs, new species

30 (25). Metapostnotal rugae not extending much more than halfway to posterior margin (Fig. 23B); metasomal terga with metallic reflections; mesepisternum distinctly but minutely punctate . . . . . *L. zephyrum* (Smith) [in part]
- Metapostnotal rugae extending more than 2/3 distance to posterior margin (Fig. 23A); metasomal terga usually brown; mesepisternum at most obscurely punctate 31

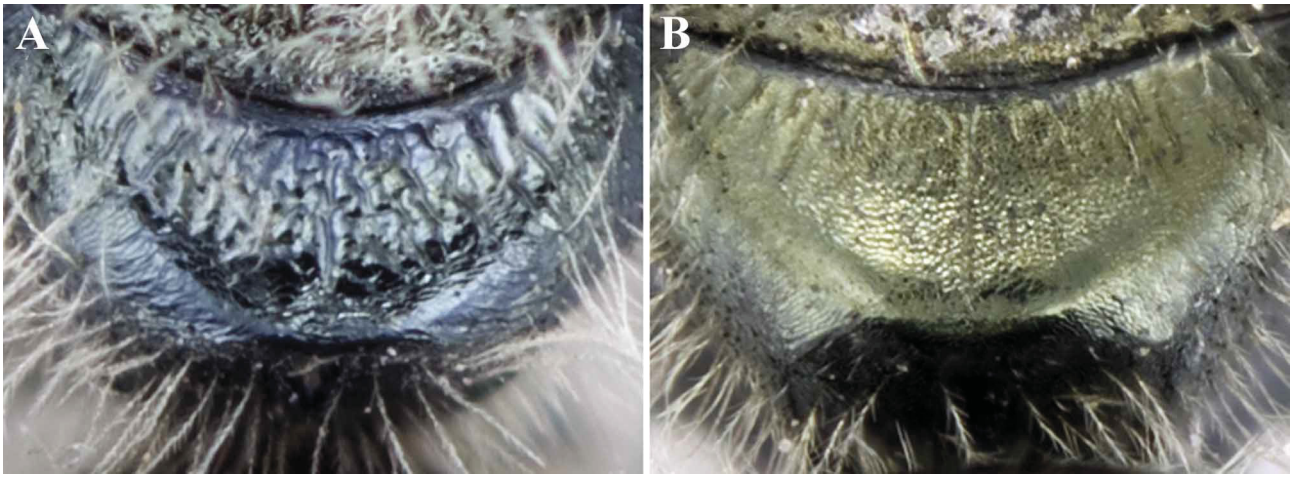

FIGURE 23. Metapostnotal rugae (A) nearly reaching posterior margin, (B) extending halfway to posterior margin. (From Gibbs 2010b).

31. T2 apical impressed area with dense and distinct punctures, not interrupted or sparser medially 32
- T2 apical impressed area with sparse or obscure punctures, interrupted or sparser medially 34
32. Mesoscutum polished posteriorly due to lack of distinct microsculpture; tegula pale; clypeus not protruding much below suborbital line . . . . . *L. trigeminum* Gibbs, new species
- Mesoscutum dull posteriorly due to presence of distinct microsculpture; tegula pale to brown; clypeus variable 33
33. Tegula usually dark brown; clypeus protruding ½ below suborbital line; T2 apical impressed area with narrow testaceous border . . . . . *L. versatum* (Robertson)
- Tegula pale straw; clypeus protruding 2/3 below suborbital line; T2 apical impressed area with wide testaceous border . . . . . *L. admirandum* (Sandhouse)

34 (31). Supraclypeal area densely punctate, interspaces mostly less than puncture diameter (i≤d) . . . . . *L. sagax* (Sandhouse)
- Supraclypeal area sparsely punctate, interspaces greater than puncture diameter at least medially (i=1–3d) 35
35. Mesoscutum dull due to microsculpture; metasomal terga lacking distinct metallic reflections . . . . . *L. ephialtum* Gibbs
- Mesoscutum polished due to microsculpture; metasomal terga with distinct metallic reflections (Sable Island, Nova Scotia) . . . . . .*L. sablense* Gibbs
36. (24). Mesoscutum mostly polished due to weakness of microsculpture 37
- Mesoscutum dull or weakly polished due to presence of distinct microsculpture 38
37. T2 basomedially with relatively dense punctation, interspaces not greater than two puncture diameters (i<2d), apical impressed area with scattered punctures across surface. . . . . *L. subviridatum* (Cockerell)
- T2 basomedially with sparse punctation, interspaces often greater than four puncture diameters (i=2–5d), apical impressed area with only a few lateral punctures . . . . . *L. abanci* (Crawford)
38 (36). Head relatively long (length/width ratio > 0.97); metapostnotal rugae not reaching posterior margin, sometimes medial carina usually distinctly longer than submedial rugae; metasomal terga with scattered basolateral tomentum 39
- Head relatively short (length/width ratio < 0.95); metapostnotal rugae reaching posterior margin; metasomal terga with virtually no tomentum. 40
39. T2 apical impressed area impunctate; mesepisternum impunctate; metapostnotum with medial carina noticeably longer than submedial rugae. . . . . *L. planatum* (Lovell)
- T2 apical impressed area punctate laterally; mesepisternum obscurely punctate; metapostnotum without medial carina longer than submedial rugae. . . . . *L. taylorae* Gibbs [in part]
40 (38). Mesoscutal punctures relatively dense between parapsidal lines, interspaces often less than 1.5 puncture diameters (i=1–1.5d); mesepisternum punctate . . . . . *L. subversans* (Mitchell)
- Mesoscutal punctures relatively sparse between parapsidal lines, interspaces often equal to 2 puncture diameters (i=1–2.5d); mesepisternum impunctate 41
41. Head and mesosoma bluish; mesoscutal punctures and mesepisternal rugae relatively coarse; tegula dark reddish brown . . . . . *L. oblongum* (Lovell)
- Head and mesosoma greenish; mesoscutal punctures and mesepisternal rugae relatively fine; tegula pale yellow . . . . . *L. alachuense* (Mitchell)
42 (23). Mesoscutum polished due to weak microsculpture; metatibia with extensive yellowish areas not limited to ends (Southern) . . . . . *L. leviense* (Mitchell)
- Mesoscutum dull due to microsculpture; metatibia with yellowish areas limited to ends 43
43. T1 acarinarial fan with narrow dorsal opening, clearly narrower than lateral acarinarial patches . . . *L. mitchelli* Gibbs [in part]
- T1 acarinarial fan with wide dorsal opening, nearly as wide as lateral acarinarial patches . . . . . *L. weemsi* (Mitchell)
44 (22). Head and mesosoma bluish; supraclypeal area sparsely punctate (i=1–4d); metapostnotum with rugae not reaching posterior margin; T4 with very sparse tomentum not obscuring surface. . . . . *L. atwoodi* Gibbs
- Head and mesosoma greenish; supraclypeal area more densely punctate (i=1–2d); metapostnotum with rugae reaching or nearly reaching posterior margin; T4 with sparse tomentum partially obscuring surface . . . . . *L. viridatum* (Lovell)
45 (17). Mesepisternum rugulose to reticulate without distinct punctures (Fig. 24B) 46
- Mesepisternum smooth with distinct punctures (Fig. 24A) 53

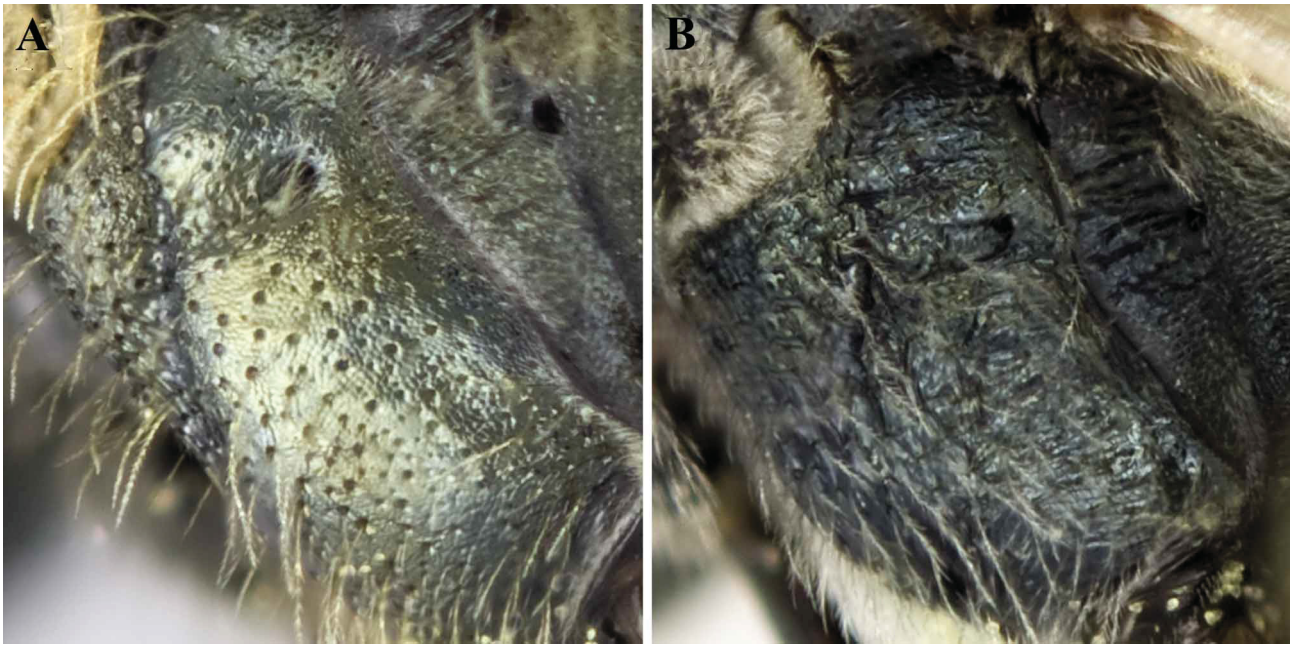

FIGURE 24. Mesepisternum (A) punctate, (B) impunctate (rugulose). (From Gibbs 2010b).

46. Clypeus with margin distal to preapical fimbriae wide, appearing divergent from the lateral margins converging below the suborbital line (*i.e*. clypeal margin with rectangular appearance) (Fig. 21B) . . . . . *L. mitchelli* Gibbs [in part]
- Clypeus with margin distal to preapical fimbriae narrow, appearing as a continuation of the lateral margins converging below the suborbital line (*i.e*. clypeal margin with trapezoidal appearance) (Fig. 21A) 47
47. Mesoscutal punctures relatively dense between parapsidal lines (i=1–1.5d); propodeum with oblique carina very fine, obscure or absent (Fig. 2D–2F) 48
- Mesoscutal punctures relatively sparse between parapsidal lines (i=1–2.5d); propodeum with oblique carina fine but distinctly present (Fig. 2B, 2C) 51
48. Postgena lineate; mesoscutal punctures relatively coarse (Fig. 76); T1 acarinarial fan sparse. . . . . *L. ceanothi* (Mitchell)
- Postgena polished due to weak microsculpture; mesoscutal punctures fine; T1 acarinarial fan dense 49
49. Metasomal terga relatively dull, light brown basally not contrasting sharply with pale apical margins; T2 apical impressed area not distinctly punctate . . . . . *L. katherineae* Gibbs, new species
- Metasomal terga relatively shiny, green to black basally contrasting sharply with pale apical margins; T2 apical impressed area distinctly punctate 50
50. Metapostnotal rugae longitudinal; T1 acarinarial fan medially interrupted by subdorsal, inverted triangular, glabrous patch . . . . . *L. georgeickworti* Gibbs, new species [in part]
- Metapostnotal rugae anastomosing; T1 acarinarial fan not interrupted by glabrous area. . . . . *L. sheffieldi* Gibbs [in part]

51 (47). Metasoma bright blue, without distinct patches of tomentum . . . . . *L. coeruleum* (Robertson) [in part]
- Metasoma brown to black, with distinct patches of tomentum 52

52. Propodeum with dorsolateral slope rugose (Fig. 25A); mesepisternum rugose; T3–T5 with hairs forming apical fringe. . . . . *L. timothyi* Gibbs
- Propodeum with dorsolateral slope ruguloso-imbricate (Fig. 25B); mesepisternum rugulose; T3–T5 without hairs forming apical fringe . . . . . *L. smilacinae* (Robertson)

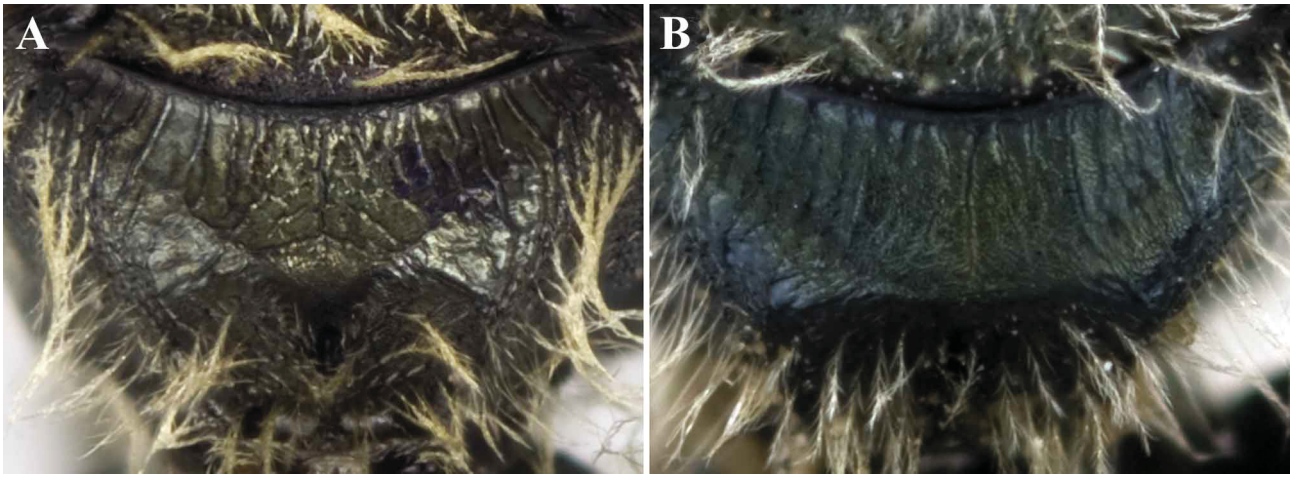

FIGURE 25. Metapostnotum (A) *L. timothyi*, (B) *L. smilacinae*. (From Gibbs 2010b).

53 (45). Tibiae and femora primarily orange-yellow . . . . . *L. tarponense* (Mitchell)
- Tibiae and femora primarily brown. 54

54. Metapostnotum with rugae reaching more than 2/3 distance to posterior margin (Fig. 23A) 55
- Metapostnotum with rugae reaching ½ distance to posterior margin or less (Fig. 23B) 61

55. T2 apical impressed areas with punctures absent or sparse; T3–T4 with tomentum absent or limited to basolateral portions (Fig. 22A) 56
- T2 apical impressed areas with punctures relatively dense; T3–T4 with tomentum on majority of disc (Fig. 22B) 60

56. Body size relatively large; metasomal terga distinctly blue or black 57
- Body size relatively small; metasomal terga light brown to golden green 58

57. Body entirely blue. . . . . *L. coeruleum* (Robertson) [in part]
- Head and mesosoma golden green, metasoma black . . . . . *L. nigroviride* (Graenicher) [in part]

58 (56). Submarginal cells two (Fig. 5B); mesepisternal punctures contiguous. . . . . *L. anomalum* (Robertson)
- Submarginal cells three (Fig. 5A); mesepisternal punctures distinctly separated. 59

59. Head and mesosoma golden green; mesoscutum with yellowish woolly hairs; metasomal terga with metallic reflections . . . . . *L. cattellae* (Ellis)
- Head and mesosoma bluish; mesoscutum with dull whitish woolly hairs; metasomal terga without metallic reflections. . . . . *L. tenax* (Sandhouse)

60 (55). Metapostnotal rugae longitudinal; T1 acarinarial fan medially interrupted by subdorsal, inverted triangular, glabrous patch . . . . . *L. georgeickworti* Gibbs, new species [in part]
- Metapostnotal rugae anastomosing; T1 acarinarial fan not interrupted by glabrous area. . . . . *L. sheffieldi* Gibbs [in part]

61 (54). Metasomal terga without metallic reflections; lower paraocular without dense tomentum; gena narrower than eye (south-eastern) . . . . . *L. flaveriae* (Mitchell) [in part]
- Metasomal terga with green metallic reflections; lower paraocular area with dense tomentum; gena usually wider than eye . . . . . *L. zephyrum* (Smith) [in part]
62 (16). Metasoma metallic, T3–T4 mostly obscured by dense white tomentum. . . . . *L. pruinosum* (Robertson)
- Metasoma non-metallic, T3–T4 only partially obscured by relatively sparse tomentum 63
63. Mesoscutal punctures between parapsidal lines relatively sparse, often more than 2 punctures diameter apart (Fig. 122) . . . 64
- Mesoscutal punctures between parapsidal lines relatively dense, only separated by 1 puncture diameter medially (Fig. 205) 67
64. Metapostnotal rugae distinct on weakly imbricate background; (T1 acarinarial fan with dorsal opening) . . . . . *L. taylorae* Gibbs [in part]
- Metapostnotal rugae very fine, obscure on tessellate background; (T1 acarinarial fan variable). 65
65. Mesoscutal punctures immediately mesad of parapsidal line dense, interspaces not greater than puncture diameter (i≤d) (Fig. 122) . . . . . *L. halophitum* (Graenicher)
- Mesoscutal punctures immediately mesad of parapsidal line sparse, interspaces greater than puncture diameter (i=2–4d) (Fig. 80) 66
66. Face relatively short (length/width ratio = 1.09–1.13) (Fig. 79B); T1 acarinarial fan dense dorsally (Fig. 80). . . . . *L. coreopsis* (Robertson) [in part]
- Face relatively long (length/width ratio = 1.20–1.21) (Fig. 150B); T1 acarinarial fan sparse dorsally (Fig. 151) (Southern) . . . . . *L. longifrons* (Baker) [in part]
67 (63). T1 acarinarial fan small, dorsomedially without erect hairs (Fig. 86); T2 apical impressed area dull, punctures obscure; mesoscutellum usually with submedial punctures widely spaced, interspaces greater than puncture diameter (i=1–3d) . . . . . *L. creberrimum* (Smith) [in part]
- T1 acarinarial fan large, dorsomedially with erect hairs (Fig. 205); T2 apical impressed area smooth, punctures distinct; mesoscutellum with submedial punctures uniformly dense, interspaces not greater than puncture diameter (i≤d). . . . . *L. tamiamense* (Mitchell) [in part]
68 (13). Head relatively elongate (length/width ratio = 1.00–1.10); mesepisternum rugulose 69
- Head relatively wide (length/width ratio = 0.95–0.99); mesepisternum at least obscurely punctate 76
69. Metapostnotal rugae high and distinct, background microsculpture imbricate; (metasoma metallic blue or green) 70
- Metapostnotal rugae low and indistinct, background microsculpture granular (*e.g.* Fig. 205); (metasoma brown, except for *L. floridanum* (Robertson)) 72
70. Lateral margins of clypeus below suborbital line subparallel distally; pubescence yellowish. . . . . *L. pilosum* (Smith)
- Lateral margins of clypeus below suborbital line convergent distally, if nearly parallel then pubescence dull white 71
71. Pubescence yellowish to dull white; supraclypeal area relatively short, 0.65–0.86 times length of clypeus (eastern) . . . . . *L. leucocomum* (Lovell)
- Pubescence dull white; supraclypeal area relatively long, 0.80–0.90 times length of clypeus (Midwestern) . . . . . *L. succinipenne* (Ellis)
72 (69). Metasomal terga metallic green; wings relatively hyaline; pterostigma pale honey-coloured . . . . . *L. floridanum* (Robertson)
- Metasomal terga brown; wings relatively dusky; pterostigma brown 73
73. Supraclypeal area distinctly flat; T2 apical impressed areas with deep and distinct punctures; head shorter (length/width ratio = 1.00–1.05) 74
- Supraclypeal area slightly convex; T2 apical impressed areas with shallow and indistinct punctures; head longer (length/width ratio = 1.05–1.09) 75
74. Supraclypeal area polished due to lack of microsculpture (Fig. 69B); clypeus with apical margin laterally reddish brown (Fig. 69B). . . . . *L. batya* Gibbs, new species
- Supraclypeal area dull due to imbricate microsculpture (Fig. 170B); clypeus with apical margin entirely brown (Fig. 170B) . . . . . *L. raleighense* (Crawford)
75 (73). T1 acarinarial fan small, dorsomedially without erect hairs (Fig. 86); T2 apical impressed area dull, punctures obscure; mesoscutellum usually with submedial punctures widely spaced, interspaces greater than puncture diameter (i=1–3d) . . . . . *L. creberrimum* (Smith) [in part]
- T1 acarinarial fan large, dorsomedially with erect hairs (Fig. 205); T2 apical impressed area smooth, punctures distinct; mesoscutellum with submedial punctures uniformly dense, interspaces not greater than puncture diameter (i≤d). . . . . *L. tamiamense* (Mitchell) [in part]
76 (68). T3 usually obscured by dense tomentum; postgena polished due to lack of microsculpture; mesoscutum polished, at least submedially. . . . . *L. perpunctatum* (Ellis)
- T3 with tomentum limited to basolateral portions; postgena dull due to lineolate microsculpture; mesoscutum imbricate throughout (south-eastern) . . . . . *L. miniatulum* (Mitchell)
77 (12). Mesepisternum relatively smooth with distinct punctures. 78
- Mesepisternum rugulose without distinct punctures. 79
78. T3–T5 apical impressed areas without hairs forming apical fringes; size large, head width = 1.94–2.11 mm; propodeal carinae and sculpture coarser (Fig. 26B) . . . . . *L. nigroviride* (Graenicher) [in part]
- T3–T5 apical impressed areas with hairs forming weak apical fringes; size normal, head width = 1.44–1.58 mm; propodeal carinae and sculpture finer (Fig. 26A) . . . . . *L. obscurum* (Robertson)

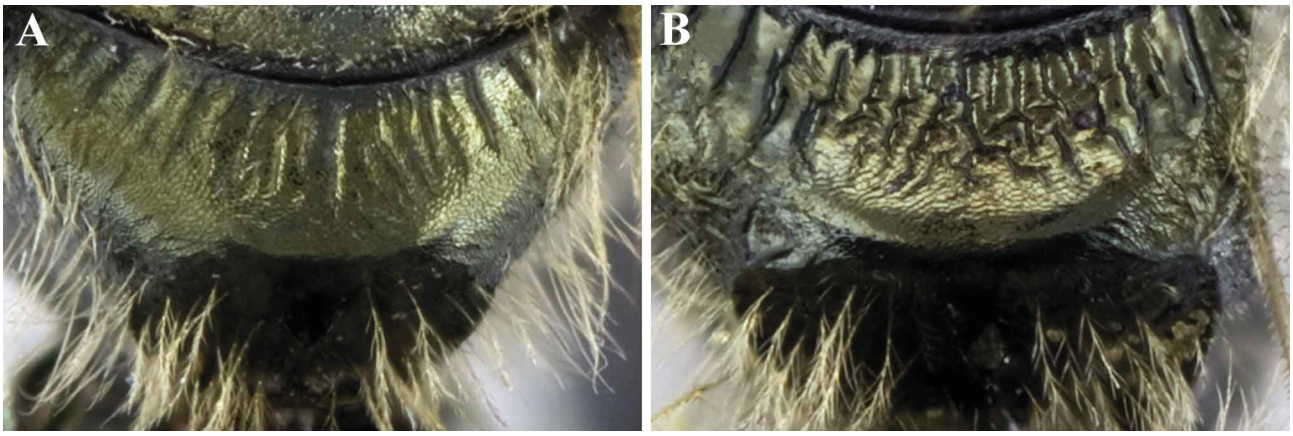

FIGURE 26. Metapostnotum (A) *L. obscurum*, (B) *L. nigroviride*. (From Gibbs 2010b).

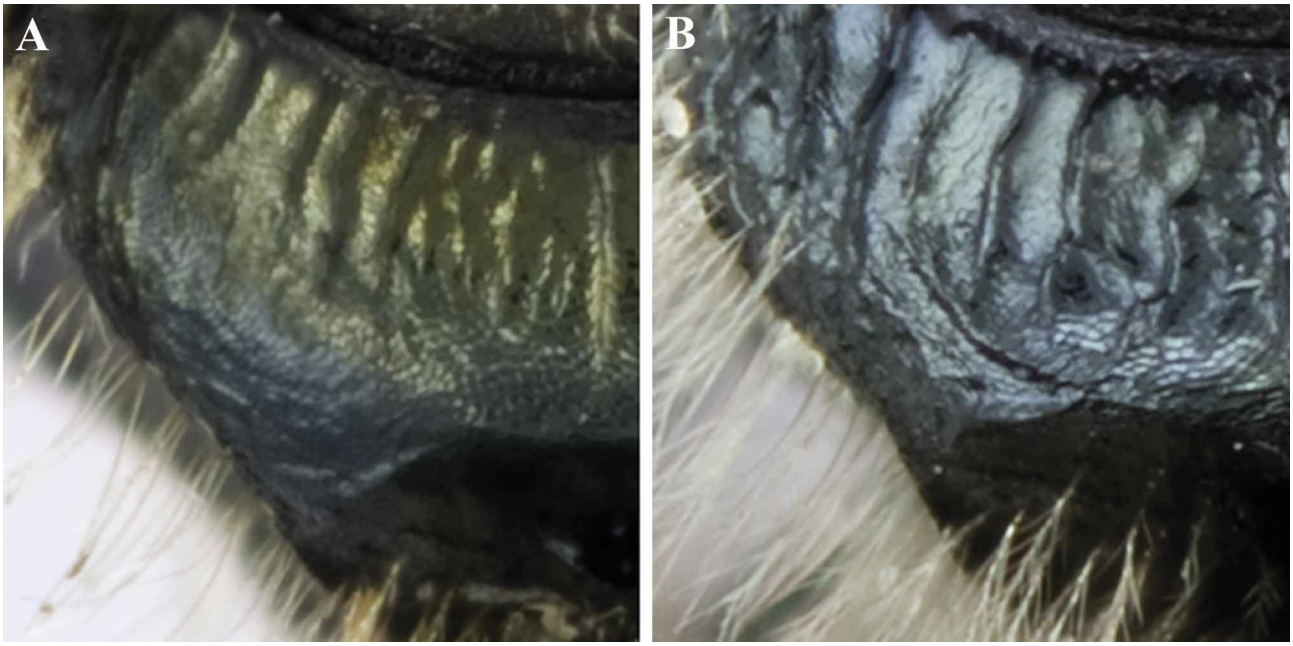

FIGURE 27. Dorsolateral slope of propodeum (A) *L. lineatulum*, (B) *L. smilacinae*. (From Gibbs 2010b).

79 (77). Frons punctures dense; size large, head width =1.70–182 mm; oblique carina linear, transversely directed (*i.e.* not U- or V-shaped) 80
- Frons punctures sparse; size small, head width =1.06–1.49 mm; oblique carina angular, with both transversely and longitudinally directed branches (*i.e.* U- or V-shaped) 83
80. Face long (length/width ratio = 1.09–1.21); mesoscutum strongly tessellate 81
- Face short (length/width ratio = 0.92–0.96); mesoscutum imbricate 82
81. Face relatively short (length/width ratio = 1.09–1.13) (Fig. 79B); T1 acarinarial fan dense dorsally (Fig. 80). . . . . *L. coreopsis* (Robertson) [in part]
- Face relatively long (length/width ratio = 1.20–1.21) (Fig. 150B); T1 acarinarial fan sparse dorsally (Fig. 151) (Southern) . . . . . *L. longifrons* (Baker) [in part]
82 (80). Head round (length/width ratio = 0.92–0.93), clypeus weakly protruding below suborbital line; propodeal dorsolateral slope imbricate (Fig. 27A) . . . . . *L. lineatulum* (Crawford)
- Head relatively long (length/width ratio = 0.95–0.96), clypeus strongly protruding below suborbital line; propodeal dorsolateral slope rugose (Fig. 27B) (Boreal, uncommon in USA). . . . . *L. novascotiae* (Mitchell)
83 (79) Mesoscutum polished due to lack of microsculpture (north-eastern, rare). . . . . *L. achilleae* (Mitchell)
- Mesoscutum dull due to presence of microsculpture (south-eastern, common). . . . . *L. apopkense* (Mitchell)
84 (5). Propodeal lateral and posterior surfaces completely separated by lateral carina (Fig. 28B) . . . . . *L. rufulipes* (Cockerell)
- Propodeal lateral and posterior surfaces incompletely separated by lateral carina (Fig. 28A). 85
85. Metapostnotal rugae not extending more than 2/3 distance to posterior margin . . . . . *L. versans* (Lovell)
- Metapostnotal rugae extending ¾ or more of distance to posterior margin (rare, see comments below). . . . . *L. hemimelas* (Cockerell)

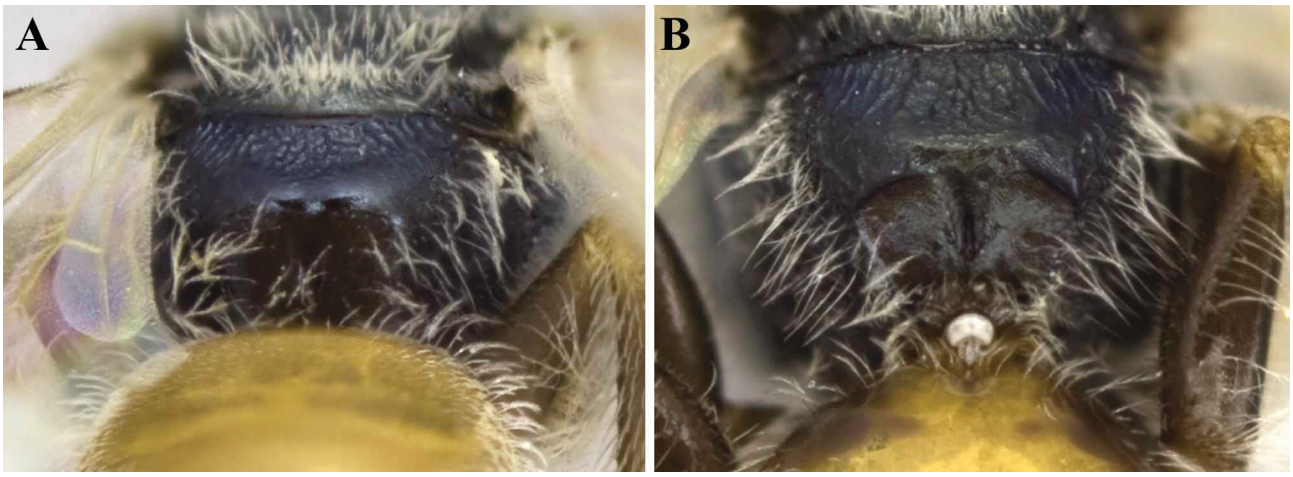

FIGURE 28. Propodeal carinae (A) weak, (B) strong. (From Gibbs 2010b).

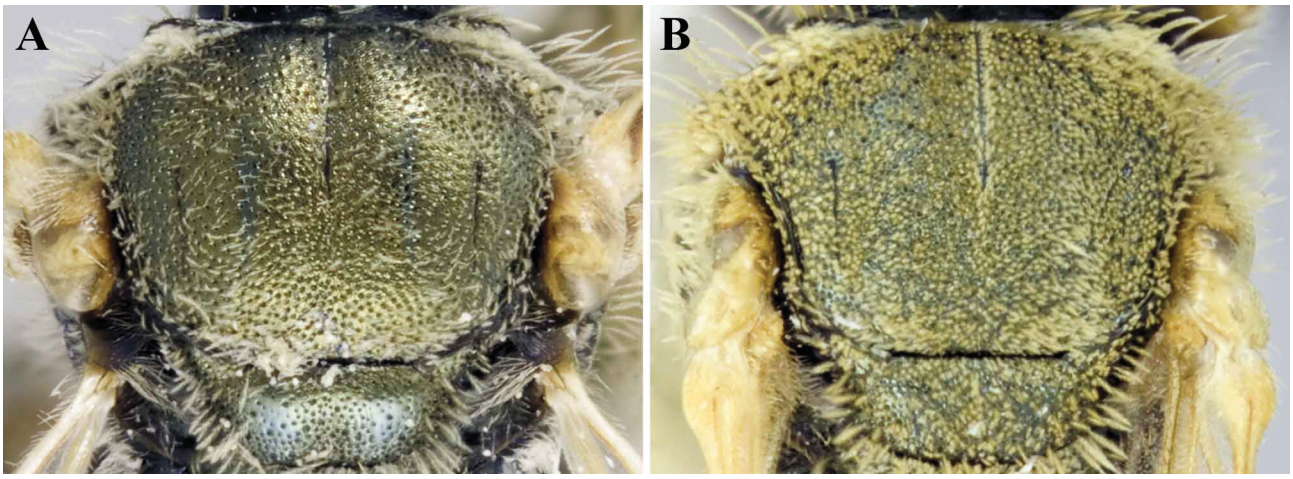

FIGURE 29. Mesoscutum (A) not obscured by tomentum, (B) obscured by tomentum (*L. vierecki*). (From Gibbs 2010b).

86 (3). Metasoma usually with distinct metallic reflections; size larger, head width > 1.7 mm (coastal sand dune specialist). . . . . *L. marinum* (Graenicher)
\- Metasoma without distinct metallic reflections; size smaller, head width < 1.5 mm 87
87. Mesepisternum shining between punctures due to weak microsculpture . . . . . *L. ellisiae* (Sandhouse)
\- Mesepisternum dull between punctures due to microsculpture 88
88. Head and mesosoma usually blue; head relatively elongate (length/width ratio = 0.95–1.10) (south-eastern) . . . . . *L. puteulanum* Gibbs
\- Head and mesosoma green with at most bluish reflections; head relatively short (length/width ratio = 0.85–1.00) 89
89. Inner hind tibial spur pectinate with 2 branches (not including apex of rachis) (rare, Illinois) . . . . . *L. carlinvillense* Gibbs
\- Inner hind tibial spur pectinate with 3 or more branches (not including apex of rachis) 90
90. Paraocular area with dense tomentum obscuring surface; metapostnotal rugae anastomosing (Florida). . . . . *L. lepidii* (Graenicher)
\- Paraocular area with sparse tomentum not obscuring surface; metapostnotal rugae longitudinal (mid-eastern) . . . . . *L. tegulare* (Robertson)
91 (2). Mesoscutum densely covered in yellowish tomentum, integument mostly or entirely obscured (Fig. 29B) . . . . . *L. vierecki* (Crawford)
\- Mesoscutum not densely covered with tomentum, integument not obscured (Fig. 29A). 92
92. Mesepisternum punctate-reticulate 93
\- Mesepisternum impunctate 98
93. Metapostnotum rugose, with rugae reaching or nearly reaching posterior margin. 94
\- Metapostnotum smooth, at most with weak rugae limited to basal margin (Southern Florida) 97
94. Clypeus with apical margin reddish (Figs. 164B, 200B) (South-eastern). 95
\- Clypeus with apical margin dark brown (Fig. 62B) (Mid-western, North-eastern) 96

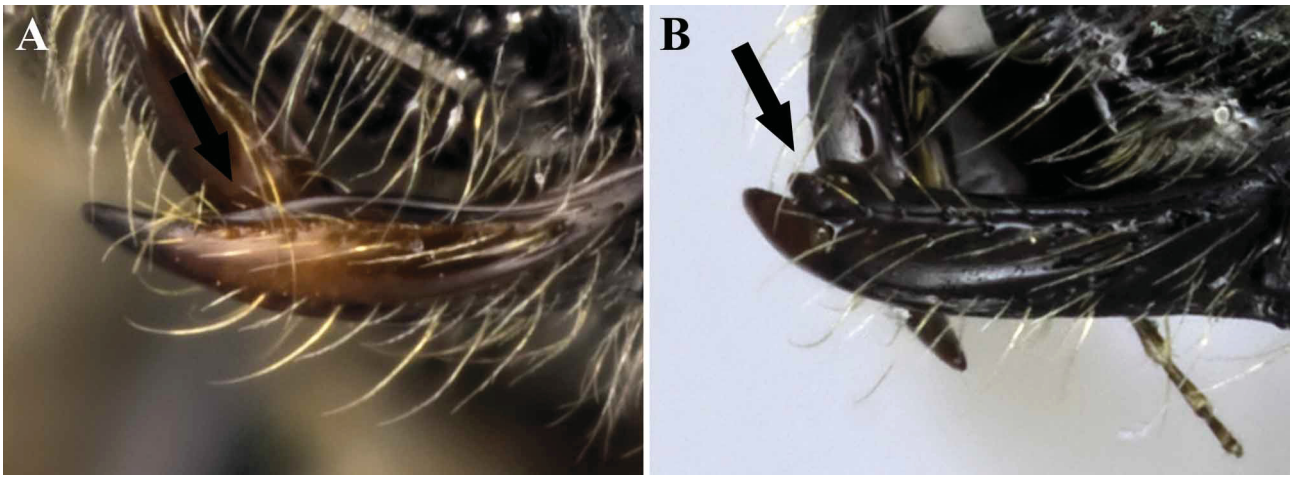

FIGURE 30. Mandible (A) without preapical tooth, (B) with preapical tooth (indicated by arrow). (From Gibbs 2010b).

95. Tegula elongate with posterior angle (Fig. 201) . . . . . *L. surianae* (Mitchell)
- Tegula ovoid without posterior angle (Fig. 165). . . . . *L. nymphale* (Smith)
96 (94). Postgena polished distally due to lack of microsculpture; metasomal terga yellowish orange (Midwestern) . . . . . *L. pictum* (Crawford)
- Postgena dull distally due to lineolate microsculpture; metasomal terga reddish orange (Coastal) . . . . . *L. arantium* Gibbs, new species
97 (93). Dull metallic; three submarginal cells; metapostnotum with basal rugae (Fig. 99) . . . . . *L. flaveriae* (Mitchell) [in part]
- Brilliant iridescent; two submarginal cells; metapostnotum without rugae . . . . . *L. eleutherense* (Engel)
98 (92). Propodeum with strong lateral carina reaching dorsal margin (Fig. 28B) (Midwestern/Boreal) . . . . . *L. testaceum* (Robertson)
- Propodeum with weak lateral carina not reaching dorsal margin (Fig. 28A) (Florida) . . . . . *L. stuartense* (Mitchell)
99 (1). Gena width greater than eye in lateral view; mandible greatly enlarged, usually extending well beyond opposing clypeal angle 100
- Gena width subequal to eye in lateral view; mandible only slightly enlarged, not extending much or at all past opposing clypeal angle 107
100. Metapostnotum smooth, with weak rugae limited to basal margin. 101
- Metapostnotum rugose, with rugae reaching or nearly reaching posterior margin. 102
101. Size small, head width 1.25–1.30 mm . . . . . *L. lionotum* (Sandhouse)
- Size large, head width 1.80–2.02 mm. . . . . *L. cephalotes* (Robertson)
102 (100). Mandible without preapical tooth (Fig. 30A) 103
- Mandible with distinct preapical tooth (Fig. 30B) 105
103. Mesepisternum distinctly punctate . . . . . *L. ascheri* Gibbs, new species
- Mesepisternum rugulose 104
104. Mandible narrow, evenly convergent over entire length; labrum with weak basal tubercle. . . . . *L. rozeni* Gibbs, new species
- Mandible wide, strongly convergent near apex; labrum with strong basal tubercle. . . . . *L. platyparium* (Robertson) [in part]
105 (102). Mesepisternum rugulose; mandible preapical tooth very small. . . . . *L. platyparium* (Dalla Torre) [in part]
- Mesepisternum vertically carinulate or smooth and punctate; mandible preapical tooth relatively large 106
106. Mesepisternum vertically carinulate, impunctate . . . . . *L. michiganense* (Mitchell)
- Mesepisternum smooth, punctate . . . . . *L. curculum* Gibbs, new species
107 (99). Pronotal ridge smoothly rounded; mandible without preapical tooth . . . . . *L. simplex* (Robertson)
- Pronotal ridge sharply angled; mandible with or without preapical tooth 108
108. Mandible with preapical tooth; inner metatibial spur usually with 3 branches . . . . . *L. izawsum* Gibbs, new species
- Mandible without preapical tooth; inner metatibial spur with 4 branches . . . . . *L. furunculum* Gibbs, new species

Key to male metallic *Lasioglossum* (*Dialictus*) of eastern North America

1. Tegula ovoid with at most weak posterior angle, usually obscurely punctate (Fig. 7B). 2
- Tegula enlarged with strong posterior angle, distinctly punctate (Fig. 7A) (except obscurely punctate in *L. surianae*; Fig. 203) 92
2. Mesoscutal punctures sparse between parapsidal lines, interspaces greater than puncture diameter (i > d) 3
- Mesoscutal punctures dense between parapsidal lines, interspaces no greater than puncture diameter (i < d) 84
3. Clypeus with apical margin brown or reddish brown 4
- Clypeus with apical margin yellow. 70

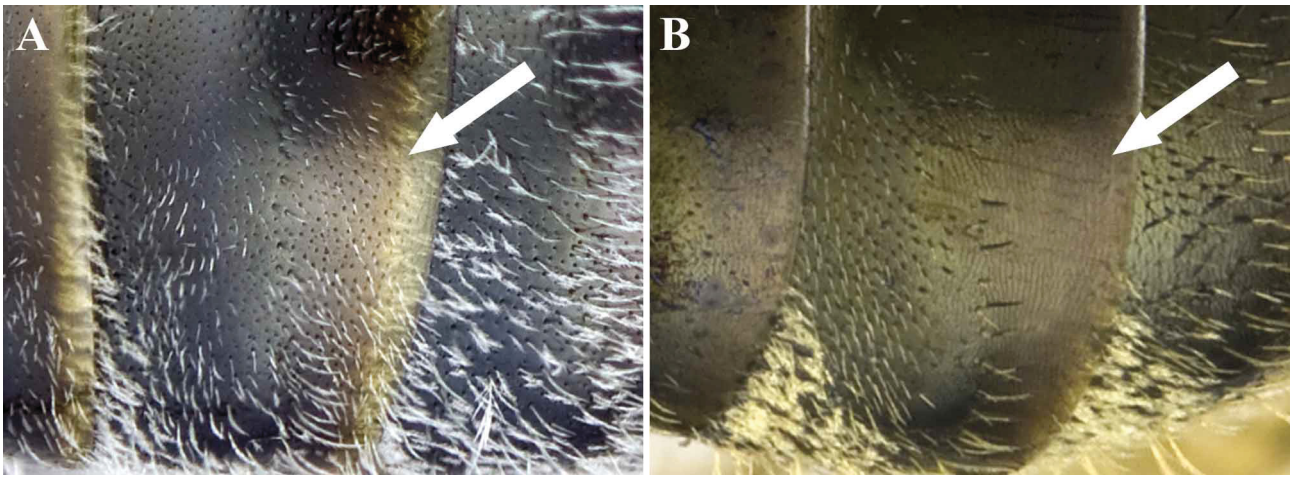

FIGURE 31. T2 apical impressed area, indicated by arrow (A) punctate, (B) impunctate. (From Gibbs 2010b).

4. Pronotal ridge broadly rounded, not forming sharp angle 5
- Pronotal ridge carinate or forming sharp angle 63
5. Forewing submarginal cells three (vein 1rs-m present) (Fig. 5A) 6
- Forewing submarginal cells two (vein 1rs-m absent) (Fig. 5B) 62
6. Mesepisternum impunctate 7
- Mesepisternum distinctly punctate 41
7. Mesoscutal punctures fine to moderately coarse; mesepisternum rugulose or weakly rugose 8
- Mesoscutal punctures very coarse; mesepisternum strongly rugose or reticulate 37
8. T2 apical impressed areas impunctate or at most a few basal punctures (Fig. 31B) 9
- T2 apical impressed areas distinctly punctate (Fig. 31A) 31
9. Mesoscutal punctures dense laterad of parapsidal line (i≤d) (Fig. 12B) 10
- Mesoscutal punctures sparse laterad of parapsidal line (i=1–3d) (Fig. 12A) 28
10. Mesoscutum dull due to strong microsculpture including on submedial and posterior portions 11
- Mesoscutum polished due to weak microsculpture at least on submedial and posterior portions 21
11. Head elongate (length/width ratio > 1.06) 12
- Head shorter (length/width ratio < 1.03) 17
12. Head very long (length/width ratio > 1.09); metapostnotal rugae weak, not reaching posterior margin 13
Head shorter (length/width ratio = 1.06–1.08); metapostnotal rugae stronger, reaching posterior margin 15
13. Mesoscutal punctures immediately mesad of parapsidal line dense (i≤d) . . . . . *L. halophitum* (Graenicher)
- Mesoscutal punctures immediately mesad of parapsidal line sparse (i=1–2d) 14
14. Head shorter (length/width ratio =1.09–1.11); mandible brown . . . . . *L. coreopsis* (Robertson)
- Head longer (length/width ratio = 1.18); mandible yellow . . . . . *L. longifrons* (Baker) [in part]
15 (12). Metabasitarsus brown . . . . . *L. katherineae* Gibbs, new species
- Metabasitarsus brownish yellow 16
16. Mesoscutal punctures immediately mesad of parapsidal line denser (i≤d); T1 anterior surface distinctly coriarious . . . . . *L. apocyni* (Mitchell)
- Mesoscutal punctures immediately mesad of parapsidal lines sparser (i=1–2d); T1 anterior surface polished . . . . . *L. fattigi* (Mitchell)
17 (11). Metapostnotal rugae extending two-thirds distance to posterior margin; penis valve with strong dorsal crest . . . . . *L. versans* (Lovell)
- Metapostnotal rugae extending to posterior margin; penis valve without dorsal crest 18
18. Mesepisternum with distinct delineation between strongly rugose dorsal portion and tessellate ventral portion (Fig. 17B) . . . . . *L. dreisbachi* (Mitchell)
- Mesepisternum without distinct delineation between dorsal and ventral portions 19
19. Mesepisternum strongly rugose on ventral portion; mesoscutum with anterolateral portion reticulate-rugulose . . . . . *L. viridatum* (Lovell)
- Mesepisternum rugulose one ventral portion; mesoscutum with anterolateral portion punctate 20
20. Tegula brownish yellow . . . . . *L. mitchelli* Gibbs
- Tegula reddish brown . . . . . *L. tenax* (Sandhouse)
21 (10). Face below eye emargination almost entirely obscured by dense tomentum; flagellomeres relatively short (length/width ratio = 1.40–1.58); S7 median lobe broadly acuminate . . . . . *L. simplex* (Robertson)
- Face below eye emargination only partially obscured by dense tomentum; flagellomeres variable; S7 median lobe narrow 22

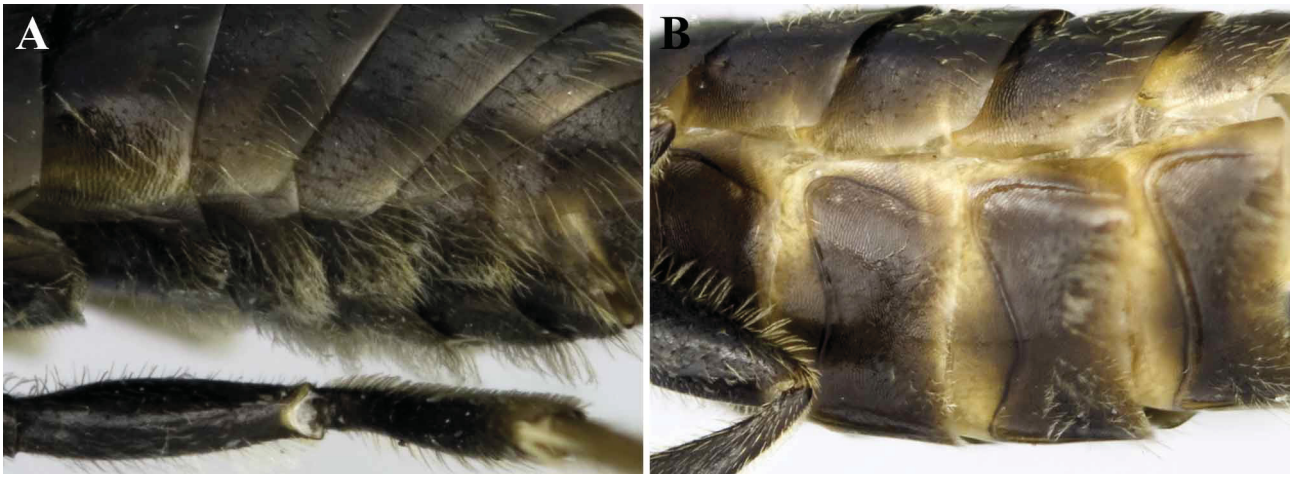

FIGURE 32. S3 (A) with dense pubescence, (B) with sparse pubescence. (From Gibbs 2010b).

FIGURE 33. Metabasitarsus (A) elongate, (B) short (*L. dubitatum*). (From Gibbs 2010b).

22. T2–T3 without basolateral tomentum 23
- T2–T3 with basolateral tomentum 27
23. Size small, head width 1.13–1.27 mm; mesepisternum with ventral half smooth, weakly imbricate . . . . . *L. imitatum* (Smith)
- Size larger, head width 1.34–1.87 mm; mesepisternum with ventral half rough, rugulose to rugose 24
24. Metapostnotum with very coarse rugae, smooth interstitial areas distinctly wider than ridges . . . . . *L. oblongum* (Lovell)
- Metapostnotum with moderately coarse rugae, smooth interstitial areas as wide as ridges 25
25. S3 with dense plumose hairs throughout (Fig. 32A). . . . . *L. laevissimum* (Smith)
- S3 with sparse hairs basally (Fig. 32B). 26
26. Metabasitarsus brown; facial tomentum relatively sparse, limited to lower paraocular area; head relatively long (length/width ratio = 1.04–1.06) . . . . . *L. abanci* (Crawford)
- Metabasitarsus brownish yellow; facial tomentum relatively dense, present on lower paraocular and clypeus; head relatively short (length/width ratio = 1.02) . . . . . *L. subviridatum* (Cockerell)

27 (22). Mesoscutum highly polished throughout due to lack of microsculpture (Sable Island) . . . . . *L. sablense* new species
- Mesoscutum weakly polished on anterior portion due to microsculpture . . . . . *L. ephialtum* new species

28 (9). Mesoscutum entirely dull due to tessellate microsculpture . . . . . *L. apopkense* (Mitchell)
- Mesoscutum mostly shiny due to lack of microsculpture 29

29. S2–S3 with moderately dense erect hairs on disc . . . . . *L. lineatulum* (Crawford)
- S2–S3 without erect hairs on disc . . . . . 30.

30. Head wide (length/width ratio = 0.94–0.95); T2 punctation sparse basally (i=2–4d) . . . . . *L. achilleae* (Mitchell)
Head longer (length/width ratio = 1.00–1.04); T2 punctation dense basally (i=1–2d). . . . . *L. novascotiae* (Mitchell)

31 (8). Mesoscutum dull due to strong microsculpture 32
- Mesoscutum polished due to weak microsculpture. 35

32. Hind basitarsis short, approximately three times longer than wide (Fig. 33B). . . . . *L. dubitatum* (Mitchell)
- Hind basitarsis elongate, approximately four times longer than wide (Fig. 33A) 33

33. Protrochanter flattened, width approximately half of length (Fig. 34B). . . . . *L. callidum* (Sandhouse)
- Protrochanter rounded, width less than half of length (Fig. 34A). 34

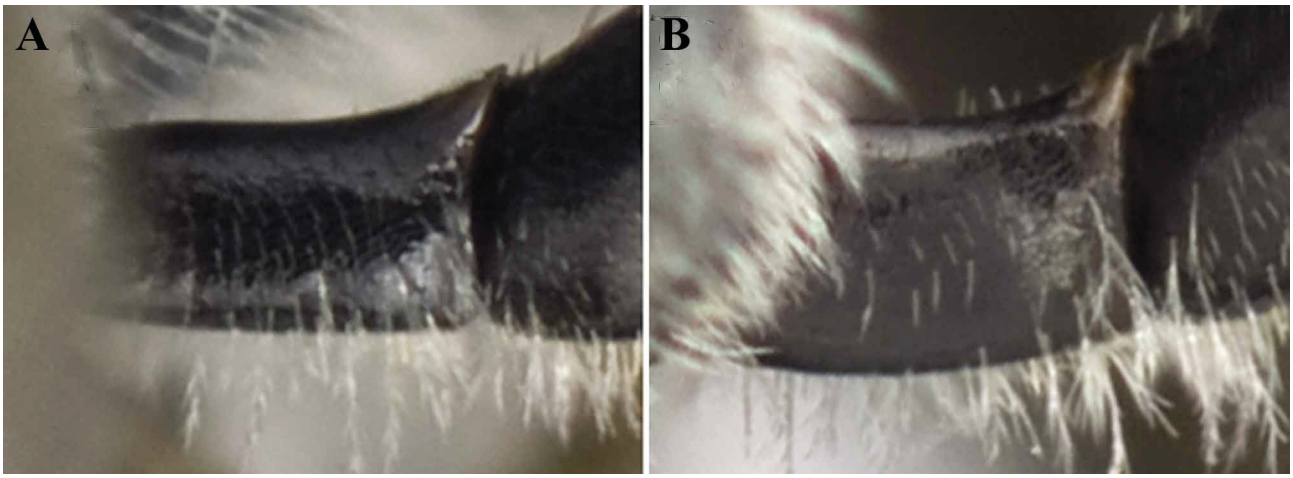

FIGURE 34. Protrochanter (A) narrow, (B) wide (male *L. callidum*). (From Gibbs 2010b).

34. Tegula usually dark reddish brown; T1–T4 apical impressed areas with distinct punctures . . . . . *L. versatum* (Robertson)
- Tegula pale brownish yellow; T1–T2 apical impressed areas with obscure punctures, T3–T4 apical impressed areas impunctate . . . . . *L. paradmirandum* (Knerer and Atwood)

35 (31). Flagellomeres short (length/width ratio = 1.21–1.31); wings pale; Head usually longer (length/width ratio = 0.99–1.08) . . . . . *L. albipenne* (Robertson) [in part]
- Flagellomeres long (length/width ratio = 1.46–1.81); wings subhyaline; head usually shorter (length/width ratio = 0.98–1.03) 36

36. Tegula brown; propodeal posterior surface rugose . . . . . *L. timothyi* Gibbs [in part]
- Tegula brownish yellow; propodeal posterior surface imbricate . . . . . *L. trigeminum* Gibbs, new species

37 (7). F2 elongate (length/width ratio = 1.39–1.83); facial pubescence moderately dense 38
- F2 short (length/width ratio = 1.13–1.33); facial pubescence very dense. 40

38. Mesoscutum with anteromedial portion punctate (Fig. 4B); clypeus and supraclypeal area with sparse tomentum not obscuring surface . . . . . *L. cressonii* (Robertson)
- Mesoscutum with anteromedial portion rugose (Figs. 4A, 178) ; clypeus and supraclypeal area with tomentum partially obscuring surface. 39

39. Tibiae and metafemora mostly brown. . . . . *L. bruneri* (Crawford)
- Tibiae and metafemora mostly orange . . . . . *L. reticulatum* (Robertson)

40 (37). Tegula with distinct punctures; mesepisternum rugose; metapostnotum with strong transverse carina on posterior margin . . . . . *L. nymphaearum* (Robertson)
- Tegula without distinct punctures; mesepisternum reticulate; metapostnotum without strong transverse carina on posterior margin . . . . . *L. albipenne* (Robertson) [in part]

41 (6). Metasomal terga mostly brown to black 42
- Metasomal terga mostly metallic or reddish 59

42. Parapsidal line a wide furrow (Fig. 15B) . . . . . *L. foveolatum* (Robertson)
- Parapsidal line a narrow groove (Fig. 15A) 43

43. S2–S4 with elongate (1.5–2.5 OD) and dense scopa-like hairs (Fig. 35A) . . . . . *L. subversans* (Mitchell)
- S2–S4 without elongate scopa-like hairs (Fig. 35B). 44

44. S5–S6 with elongate lateral hairs visible from dorsal view; metapostnotal rugae not extending to posterior margin (Fig. 101) . . . . . *L. flaveriae* (Mitchell)
- S5–S6 without elongate lateral hairs visible from dorsal view; metapostnotal rugae extending to posterior margin 45

45. T2 apical impressed area punctate (Fig. 31A). 46
- T2 apical impressed area impunctate (Fig. 31B). 52

46. Tarsi brown to reddish brown 47
- Tarsi yellow to orange 48

47. Head more elongate (length/width ratio = 1.06–1.08); supraclypeal area with contiguous punctures. . . . . *L. sheffieldi* Gibbs
- Head less elongate (length/width ratio = 1.00–1.03); supraclypeal area with distinctly separated punctures (i=1–1.5d) . . . . . *L. perpunctatum* (Ellis)

48 (46). Flagellomeres short (length/width ratio = 1.21–1.31); mesepisternal punctures contiguous/reticulate; head relatively long (length/width ratio = 0.99–1.08) . . . . . *L. albipenne* (Robertson) [in part]
- Flagellomeres elongate (length/width ratio = 1.44–2.00); mesepisternal punctures distinctly separated; head relatively wide (length/width ratio = 0.95–1.00) 49

49. Size small (length = 3.88–4.50 mm); mesoscutal and mesepisternal punctures relatively dense (most interspaces less than 1.5 puncture diameters). 50
- Size large (length = 4.94–5.26 mm); mesoscutal and mesepisternal punctures relatively sparse (many interspaces greater than 2 puncture diameters). 51

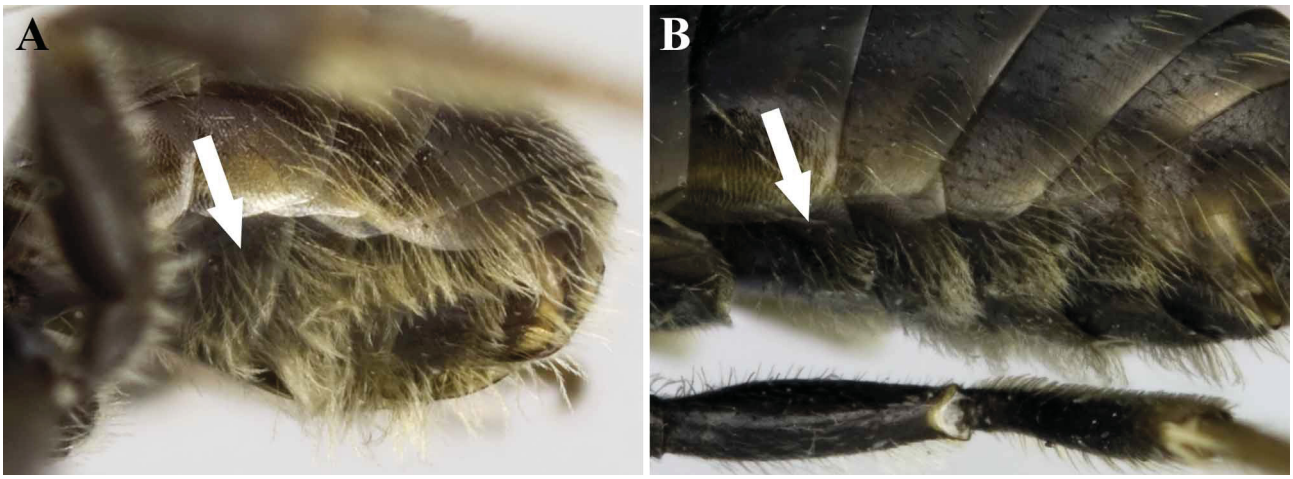

FIGURE 35. Metasomal sterna, indicated by arrow (A) pubescence long, scopa-like (*L. subversans*), (B) pubescence short. (From Gibbs 2010b).

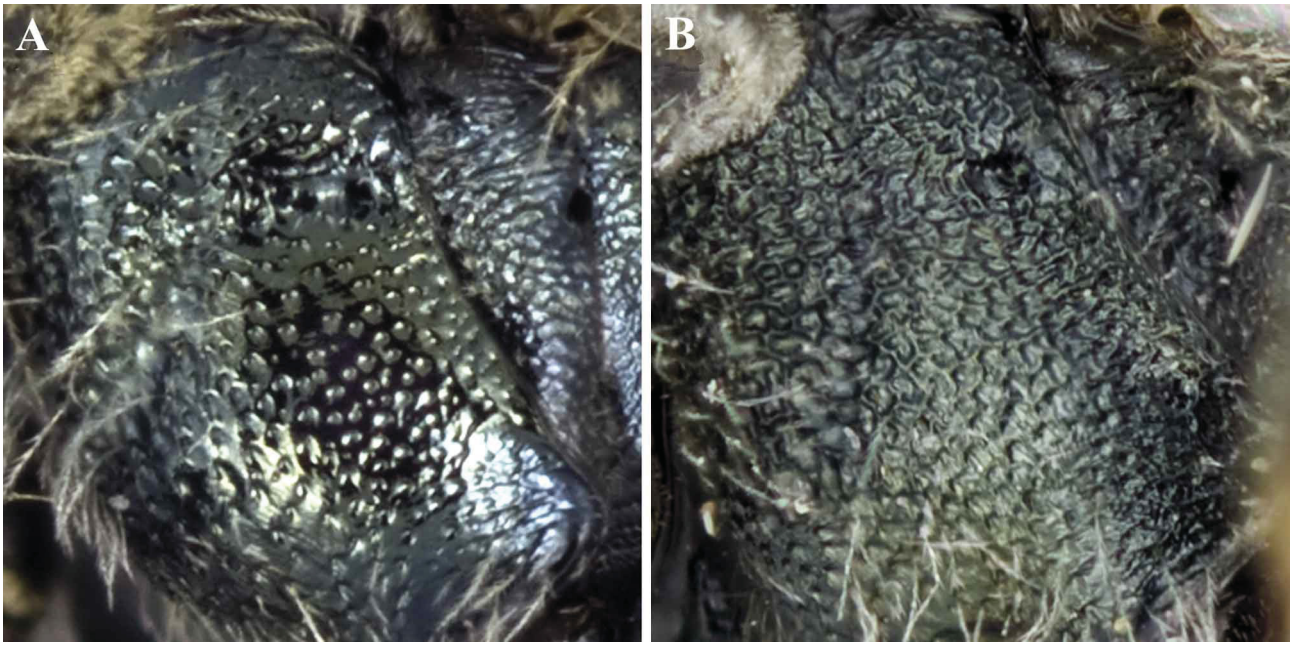

FIGURE 36. Mesepisternum (A) punctate, (B) reticulate-rugose. (From Gibbs 2010b).

50. T2–T3 with sparse basolateral tomentum; mesoscutum pale green . . . . . *L. arantium* Gibbs, new species
- T2–T3 without basolateral tomentum; mesoscutum blue . . . . . *L. miniatulum* (Mitchell)
51 (49). T2 apical impressed area with numerous punctures . . . . . *L. smilacinae* (Robertson) [in part]
- T2 apical impressed area with few, widely scattered punctures . . . . . *L. gotham* Gibbs, new species [in part]
52 (45). Head extremely long (length/width ratio = 1.18) (Fig. 152B); mesoscutum coarsely tessellate (Southern). . . . . *L. longifrons* (Baker) [in part]
- Head shorter (length/width ratio); mesoscutum imbricate or polished 53
53. Mesoscutal punctures moderately coarse; hypoepimeral area polished due to weak microsculpture, punctation deep and disinct 54
- Mesoscutal punctures fine; hypoepimeral area ruguloso-imbricate, punctation if present fine or obscure 55
54. Metasomal terga with moderately dense punctures reaching the premarginal line. . . . . *L. cattellae* (Ellis) [in part]
- Metasomal terga with moderately dense punctures not reaching premarginal line . . . . . *L. tenax* (Sandhouse)
55 (53). Size large, head width 1.75–1.85 mm; mesepisternum golden; S3 with very dense yellowish hairs . . . . . *L. nigroviride* (Graenicher)
- Size smaller, head width 1.32–1.56 mm; mesepisternum blue or green; S3 with, at most, moderately dense dull white hairs. 56
56. Mesepisternum with sparse punctures, distinct throughout (i=1–4d); metasomal terga with apical impressed areas coriarious. . . . . *L. heterognathum* (Mitchell)
- Mesepisternum with moderately dense punctures, obscure on dorsal portion (i=1–2d); metasomal terga with apical impressed areas polished 57

57. Mesoscutal punctures laterad of the parapsidal lines sparse (i=1–2d); S3 with sparse plumose hairs . . . . . *L. obscurum* (Robertson)
- Mesoscutal punctures laterad of the parapsidal lines dense (i≤d); S3 with dense plumose hairs 58
58. T2 apical impressed area with numerous punctures . . . . . *L. smilacinae* (Robertson) [in part]
- T2 apical impressed area with few, widely scattered punctures . . . . . *L. gotham* Gibbs, new species [in part]
59 (41). Face with dense pubescence below level of eye emargination; metasomal terga often with extensive reddish colour 60
- Face with dense pubescence limited to lower paraocular area; metasomal terga without reddish colour 61
60. Metasomal terga with basolateral tomentum; punctation fine; F2–F10 moderately long (length/width ratio = 1.75–1.86) . . . . . *L. zephyrum* (Smith) [in part]
- Metasomal terga without basolateral tomentum; punctation relatively coarse; F2–F10 moderately short (length/width ratio = 1.25–1.45) . . . . . *L. pictum* (Crawford)
61 (59). Body blue; hypoepimeral area rugulose; size large, head width = 1.81 mm . . . . . *L. coeruleum* (Robertson)
- Mesoscutum golden green; hypoepimeral area punctate; size small, head width = 1.30–1.42 mm . . . . . *L. cattellae* (Ellis) [in part]
62 (5). Head and mesosoma dull metallic; retrorse lobe present . . . . . *L. anomalum* (Robertson)
- Head and mesosoma brilliant iridescent; retrorse lobe absent (southern Florida) . . . . . *L. eleutherense* (Engel)
63 (4). Mesoscutum coarsely reticulate-rugose in part (Fig. 129) . . . . . *L. hartii* (Robertson)
- Mesoscutum not rugose 64
64. Metapostnotal rugae nearly reaching posterior margin 65
- Metapostnotal rugae not extending 1/3 distance to posterior margin 69
65. Mesepisternum completely smooth with distinct punctures throughout; (S7 median lobe clavate) . . . . . *L. wheeleri* (Mitchell)
- Mesepisternum partially rugulose with punctures absent or present posteriorly; (S7 variable) 66
66. S7 median lobe clavate . . . . . *L. michiganense* (Mitchell)
- S7 medial lobe broadly acuminate 67
67. Lower paraocular area obscured by very dense tomentum; anterior margin of mesoscutum not overlapping medial portion of pronotal collar . . . . . *L. rozeni* Gibbs, new species
- Lower paraocular area partially obscured by tomentum; anterior margin of mesoscutum overlapping medial portion of pronotal collar 68
68. Postgena polished; mesoscutum bluish . . . . . *L. platyparium* (Robertson)
- Postgena imbricate; mesoscutum greenish . . . . . *L. izawsum* Gibbs, new species
69 (64). Size small, head width = 1.13–1.20 mm . . . . . *L. lionotum* (Sandhouse)
- Size large, head width = 1.54 mm . . . . . *L. cephalotes* (Dalla Tone)
70 (3). Tibiae mostly yellowish orange; (mesepisternum tessellate with shallow punctures) 71
- Tibiae mostly brown; (mesepisternum variable) 72
71. Femora brown; metapostnotal rugae reaching posterior margin; propodeal dorsolateral slope coarsely rugose . . . . . *L. alachuense* (Mitchell) [in part]
- Femora yellowish orange; metapostnotal rugae not reaching posterior margin; propodeal dorsolateral slope imbricate-rugulose . . . . . *L. tarponense* (Mitchell)
72 (70). Clypeus basal half yellow; flagellomeres elongate; retrorse lobe slender and parallel sided; (rare Midwestern, or boreal) 73
- Clypeus distal margin yellow; flagellomeres variable; retrorse lobe not slender and parallel sided 74
73. Mesepisternum punctate; metasomal terga with some pale yellow-orange colour . . . . . *L. testaceum* (Robertson)
- Mesepisternum impunctate; metasoma terga reddish brown . . . . . *L. rufulipes* (Cockerell)
74 (72). Head very long (length/width ratio = 1.13–1.21); wing varibale; metasomal terga metallic 75
- Head shorter (length/width ratio < 1.13); wings normal; metasomal terga variable 76
75. Wings very pale; head very long (length/width ratio = 1.18–1.21); colour usually blue . . . . . *L. pruinosum* (Robertson)
Wings not pale; head shorter (length/width ratio = 1.13–1.17); colour usually green . . . . . *L. leucocomum* (Lovell)
76 (74). Mesepisternal punctures present and distinct; metasoma terga variable 77
- Mesepisternal punctures absent or obscure; metasomal terga brown 80
77. Gena usually with distinct tubercle; head elongate (length/width ratio 1.08–1.13) . . . . . *L. disparile* (Cresson)
- Gena without tubercle; head shorter (length/width ratio 0.99–1.03) 78
78. T2 apical impressed area impunctate; metasomal terga mostly brown . . . . . *L. georgeickworti* Gibbs, new species [in part]
T2 apical impressed area punctate; metasomal terga mostly reddish or green 79
79. Metasomal terga with greenish reflections; F2–F10 longer (length/width ratio = 1.75–1.86); punctation relatively fine . . . . . *L. zephyrum* (Smith) [in part]
- Metasomal terga without greenish reflections; F2–F10 shorter (length/width ratio = 1.33–1.50); punctation relatively coarse (south-eastern) . . . . . *L. nymphale* (Smith)
80 (76). Head wide (length/width ratio = 0.94–0.95); propodeal oblique carina coarse . . . . . *L. illinoense* (Robertson)
- Head relatively long (length/width ratio = 0.97–1.04); propodeal oblique carina fine 81
81. Metatibia with yellow extending from base to apex; head shorter (length/width ratio = 0.97–0.99); (Southern) 82
- Metatibia with yellow only at base and apex; head longer (length/width ratio = 1.00–1.04); (Northern) 83

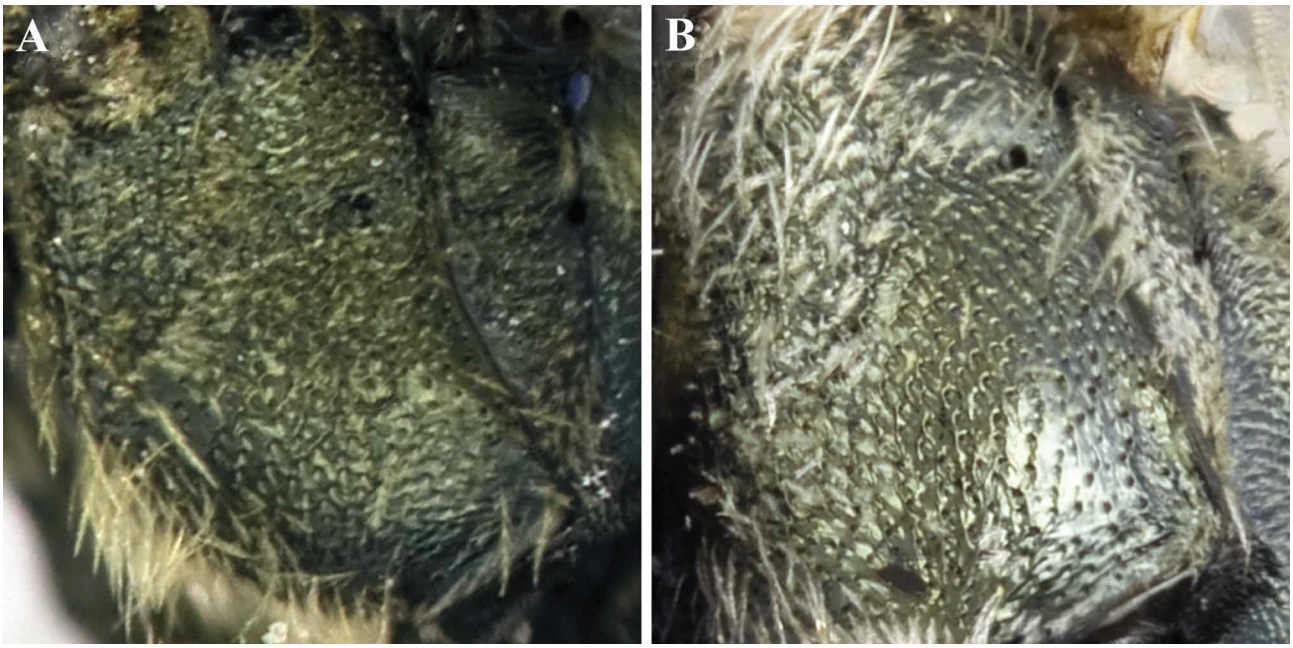

FIGURE 37. Mesepisternum (A) rugulose, without distinct puncture, (B) rugulose, with distinct punctures ventrally (*L. succinipenne*). (From Gibbs 2010b).

82. Flagellomere brown ventrally; preëpisternum, metapostnotum and propodeal dorsolateral slope coarsely rugose; mesepisternum obscurely punctate. . . . . *L. alachuense* (Mitchell) [in part]
- Flagellomere orange ventrally; preëpisternum, metapostnotum and propodeal dorsolateral slope rugulose; mesepisternum impunctate. . . . . *L. leviense* (Mitchell)

83 (81). Mesoscutum tessellate . . . . . *L. admirandum* (Sandhouse)
- Mesoscutum weakly imbricate to polished. . . . . *L. sagax* (Sandhouse)

84 (2). T2 apical impressed area with deep and distinct punctation; eyes strongly convergent below 85
- T2 apical impressed area impunctate or with obscure punctation; eyes weakly convergent below 91

85. Metasomal terga metallic green or blue 86
- Metasomal terga brown to reddish 89

86. Mesepisternum rugulose with distinct punctures ventrally (Fig. 37B). . . . . *L. succinipenne* (Ellis)
- Mesepisternum rugulose without distinct punctures ventrally (Fig. 37A) 87

87. Clypeus *sometimes* without distal yellow band; metapostnotal rugae *usually* weaker. . . . . *L. floridanum* (Robertson)
- Clypeus with distal yellow band; metapostnotal rugae *usually* stronger . . . . . *L. pilosum* (Smith)

89 (85). Mesepisternum punctate . . . . . *L. vierecki* (Crawford)
- Mesepisternum rugulose 90

90. Supraclypeal area dull due to microsculpture . . . . . *L. raleighense* (Crawford)
- Supraclypeal area polished due to lack of microsculpture . . . . . *L. batya* Gibbs, new species

91 (84). Mesoscutellar punctures sparse submedially (i=1–1.5d); T2 apical impressed area with obscure punctation; S5 margin weakly concave . . . . . *L. creberrimum* (Smith)
- Mesoscutellar punctures dense submedially (i≤d); T2 apical impressed area without punctation; S5 margin strongly concave . . . . . *L. tamiamense* (Mitchell)

92 (1). Tegula pale yellow, obscurely punctate. . . . . *L. surianae* (Mitchell)
- Tegula brown, distinctly punctate 93

93. Metasomal terga metallic; T1 laterally with sparse tomentum (coastal dunes) . . . . . *L. marinum* (Crawford)
- Metasomal terga brown to black; T1 laterally without tomentum 94

94. T2–T3 with dense punctures limited to basal half and premarginal line (Fig. 38B). . . . . *L. ellisiae* (Sandhouse)
- T2–T3 with dense punctures except on apical impressed margins (Fig. 38A) 95

95. Face with abundant tomentum, obscuring most of integument below eye emargination; antennal sockets distant, interantennal distances greater than antennal-ocular distance (IAD/AOD ratio = 1.4) (Florida). . . . . *L. lepidii* (Graenicher)
- Face with sparse tomentum, obscuring only integument on lower paraocular; antennal sockets distant, interantennal distances greater than antennal-ocular distance (IAD/AOD ratio = 1.0–1.1). 96

96. Head and mesosoma green to bluish; facial tomentum mostly limited to paraocular areas (southern Ontario and eastern USA north of Florida) . . . . . *L. tegulare* (Robertson)
- Head and mesosoma blue; facial tomentum more evenly distributed on face (south-eastern USA) . . . . . *L. puteulanum* Gibbs

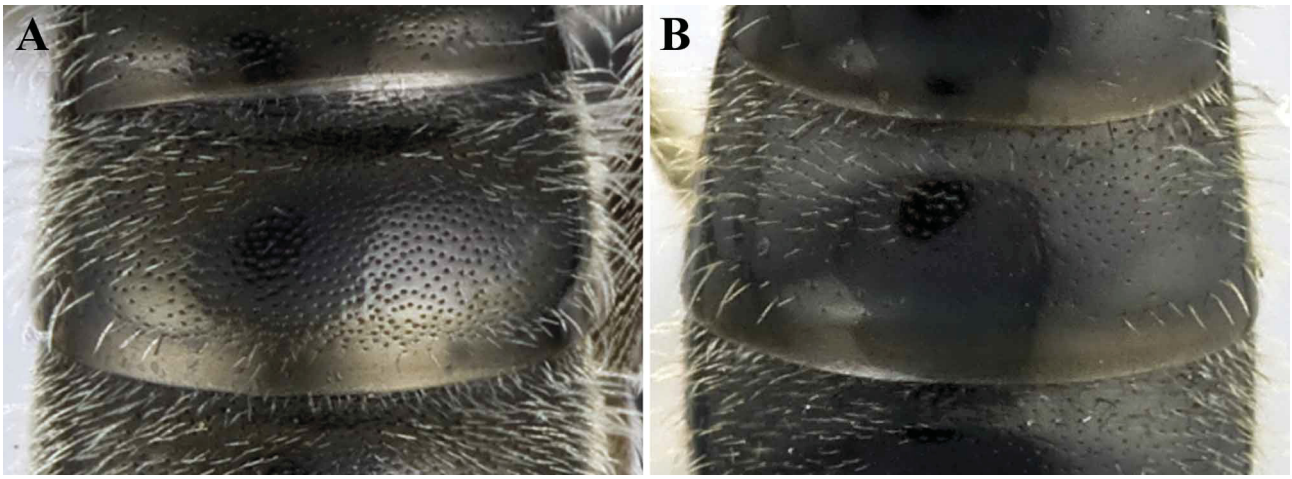

FIGURE 38. T2 punctures (A) dense basal to premarginal line, (B) sparse basal to premarginal line (*L. ellisiae*). (From Gibbs 2010b).

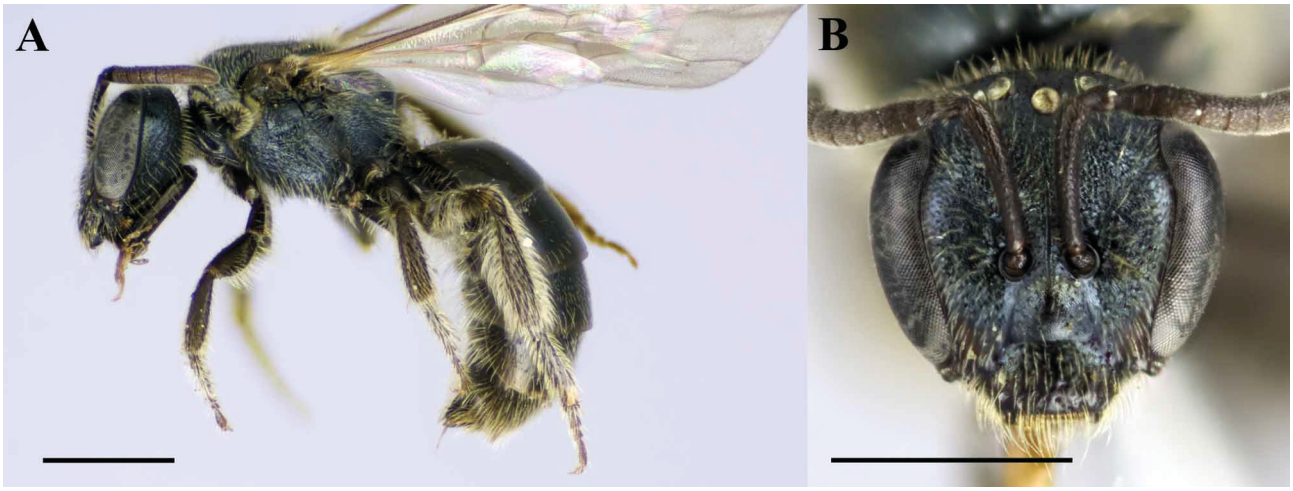

FIGURE 39. *Lasioglossum abanci* (Crawford) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Lasioglossum (*Dialictus*) *abanci* (Crawford)

(Figures 39–43)

Halictus abanci Crawford 1932: 71. ♀.

Holotype. ♀ USA, North Carolina, Swain Co., Andrews Bald, Mt. 6000 ft., 26.vii.1923 (J.C. Crawford); [NMNH: 40305]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *abanci*, p. 1111 (catalogue); Mitchell, 1960: *Dialictus abanci* ♀, p. 376 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *abanci*, p. 462 (catalogue); Hurd, 1979: *Dialictus abanci*, p. 1963 (catalogue); Moure & Hurd, 1987: *Dialictus abanci*, p. 97 (catalogue).

Diagnosis. Female *L. abanci* can be recognised by the following diagnostic combination: head round to slightly elongate (length/width ratio = 1.00–1.02); mesoscutum polished due to weak microsculpture, punctures sparse between parapsidal lines (i=1–2.5d), denser laterad of parapsidal line (i=1–1.5d); tegula reddish brown; mesepisternum rugulose, obscurely punctate; metapostnotum with distinct medial carina and weak submedial rugae not extending more than 2/3 distance to posterior margin (Fig. 40); T1 acarinarial fan with wide dorsal opening (Fig. 40); metasomal terga brown, polished due to weak microsculpture, apical halves nearly impunctate, T2 basomedially with sparse punctures (i=2–5d); T2–T3 basolaterally and T4 entirely with very sparse tomentum and weak apical fringes. They are similar to *L. planatum* and *L. oblongum*, both of which have mesoscutum dull due to microsculpture and mesepisternum impunctate. Female *L. oblongum* have coarser metapostnotal rugae. Female *L. subviridatum* and *L. taylorae* are also similar but have denser punctation on metasomal terga. Female *L. taylorae* also have head elongate.

FIGURE 40. *Lasioglossum abanci* (Crawford) female, dorsal view of mesosoma.

Male *L. abanci* can be recognised by the following diagnostic combination: head elongate (length/width ratio = 1.04–1.06); facial tomentum limited to lower paraocular area; F2–F10 elongate (length/width ratio = 1.86–2.08); mesoscutum polished, punctures fine, sparse between parapsidal lines (i=1–2.5d) (Fig. 42); mesepisternum rugulose; tarsi reddish brown; metasomal terga without tomentum; apical impressed areas impunctate, and S3 with sparse apical pubescence. They are most similar to *L. laevissimum* and *L. subviridatum*, both of which have brownish yellow tarsi. Male *L. laevissimum* also have dense pubescence across S3.

Redescription. FEMALE. Length 5.45–6.23 mm; head length 1.51–1.70 mm; head width 1.51–1.66 mm; forewing length 4.66–4.72 mm.

Colouration. Head and mesosoma blue with green reflections. Clypeus with apical half blackish brown and basal half, and supraclypeal area greenish. Antenna dark brown, flagellum with ventral surface reddish brown. Tegula translucent reddish brown. Wing membrane subhyaline, venation and pterostigma dark amber. Legs dark brown, except medio- and distitarsi ferruginous. Metasoma blackish brown, terga and sterna with apical margins reddish brown.

Pubescence. Dull white. Sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (1.5–2 OD). Lower paraocular area and gena without subappressed tomentum. Propodeum with dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with sparse, fine hairs. T1 acarinarial fan with dorsal opening wider than lateral hair patches. T2–T3 basolaterally and T4 basally with at most small patch of tomentum. T2 apicolateral and T3–T4 apical margins with very sparse apical fringes, virtually absent.

Surface sculpture. Face imbricate, punctation fine. Clypeus polished, basal margin weakly imbricate, punctation sparse (i=1–3d). Supraclypeal area polished medially, punctation sparse (i=1–3.5d). Lower paraocular area and antennocular area punctation moderately sparse (i=1–1.5d). Upper paraocular area and frons reticulate-punctate.

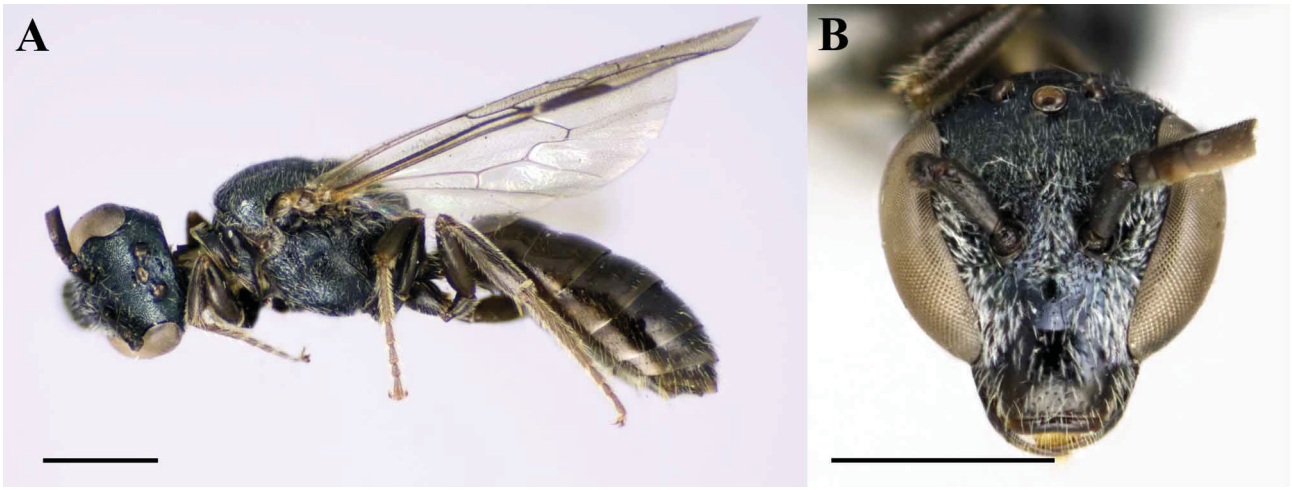

FIGURE 41. *Lasioglossum abanci* (Crawford) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

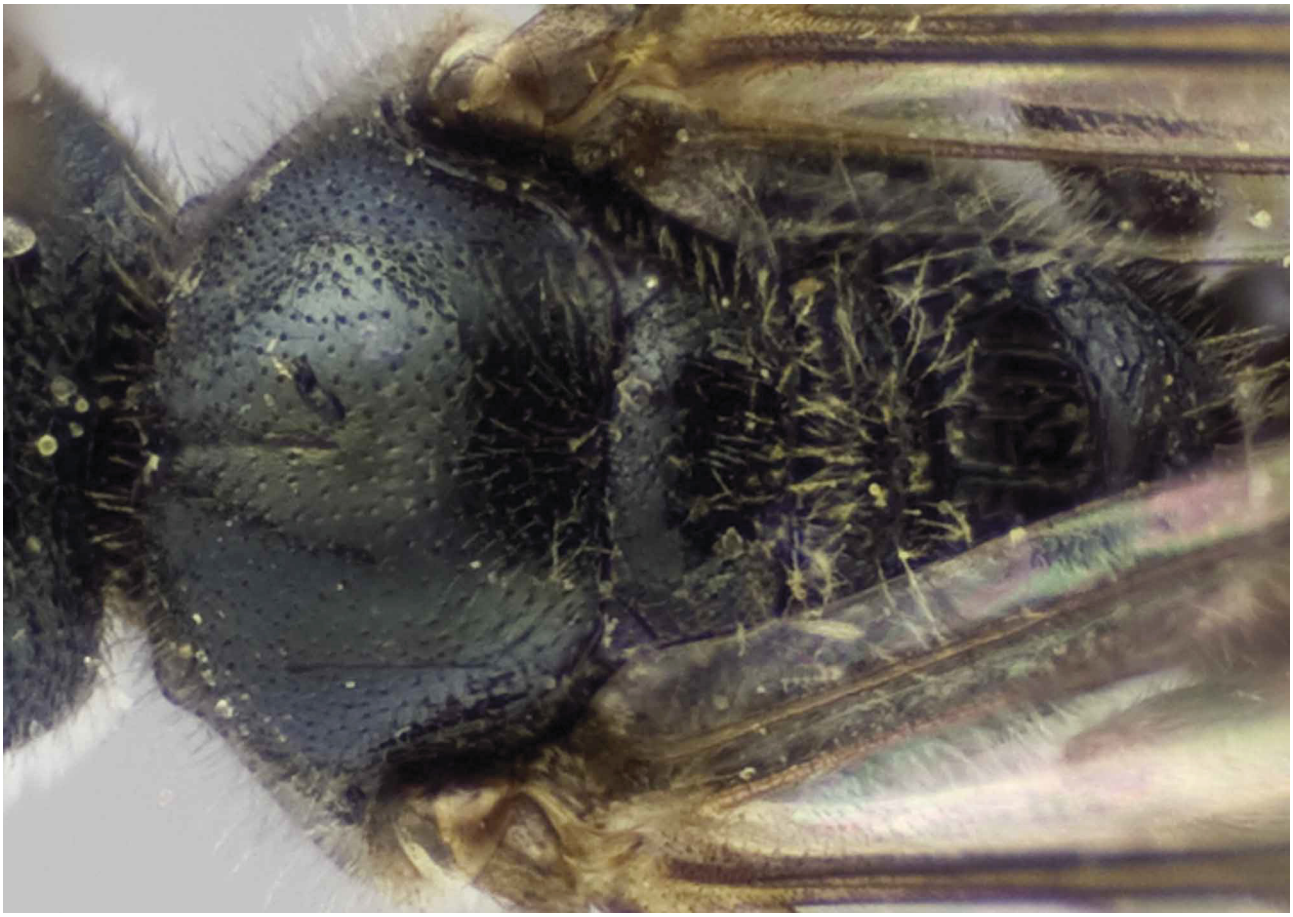

FIGURE 42. *Lasioglossum abanci* (Crawford) male, dorsal view of mesosoma.

Ocellocular area punctation obscure (i=1–1.5d). Gena lineolate. Postgena weakly imbricate. Mesoscutum polished, imbricate medially, punctation fine, moderately sparse between parapsidal lines (i=1–2.5d), relatively sparse laterad of parapsidal line (i=1–1.5d), dense on anterolateral portion (i≤d). Mesoscutellum polished, submedial punctation sparse (i=2–5d). Axilla punctate. Metanotum ruguloso-imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate, obscurely punctate (i=1–1.5d). Mesepisternum dorsal half rugulose, obscurely punctate (i=1–2d), ventral half rugulose-imbricate. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum rugoso-carinulate, medial carina nearly reaching posterior margin, submedial rugae not extending more than 2/3 distance to posterior margin. Propodeum with dorsolateral slope rugulose-imbricate, lateral surface imbricate-tessellate, posterior surface tessellate. Metasomal terga polished except weakly coriarious on apical margins, punctation on basal halves sparse (i=1–2d), especially medially (i=1–4d), absent from apical half except along premarginal line and apicolaterally.

Structure. Head round (length/width ratio = 1.00–1.02). Eyes weakly convergent below (UOD/LOD ratio = 1.14–1.17). Clypeus 2/3 below suborbital tangent, apicolateral margins convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2.5–3 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–5 branches. Metapostnotum moderately elongate (MMR ratio = 1.21–1.26), posterior margin narrowly rounded onto posterior surface. Propodeum with oblique carina very weak, lateral carina weak, not reaching dorsal surface.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length. 5.32–5.75 mm; head length. 1.56–1.63 mm; head width. 1.48–1.57 mm; forewing length. 4.48–4.54 mm.

Colouration. Head blackish blue. Mesosoma greenish except propodeum bluish. Flagellum with ventral surface bright orange-yellow. Tegula reddish brown with amber margin. Pterostigma reddish brown. Legs brown, except tarsi reddish brown.

Pubescence. Lower paraocular area width moderately dense tomentum partially obscuring surface. Gena without evident tomentum. S3 apicolaterally and S4–S5 laterally with moderately dense patches of plumose hairs (1–1.5 OD).

Surface sculpture. Clypeal punctation sparse (i=1–3d). Metanotum rugose. Metapostnotum coarsely rugoso-carinulate, reaching posterior margin. Propodeum with dorsolateral slope, lateral surface and posterior surface rugose.

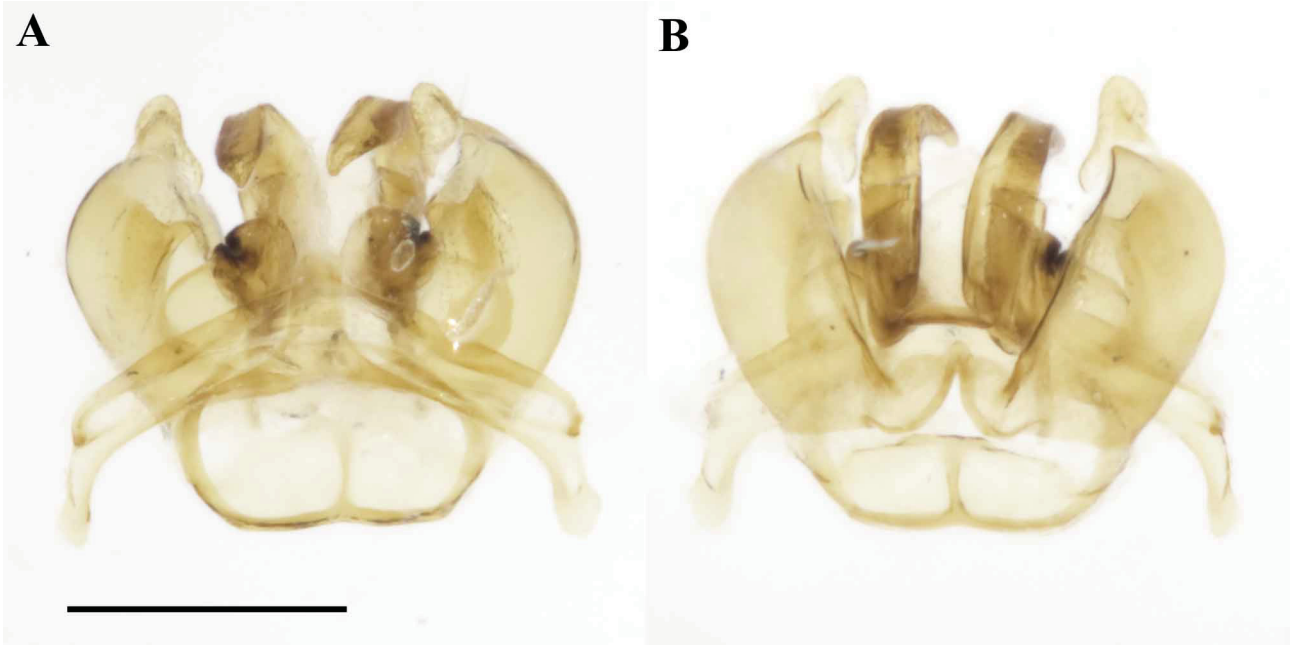

FIGURE 43. *Lasioglossum abanci* (Crawford) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

Structure. Head relatively elongate (length/width ratio = 1.04–1.06). Eyes strongly convergent below (UOD/LOD ratio = 1.46). Clypeus 1/2 below suborbital tangent, apicolateral margins weakly convergent. Supraclypeal area elongate. Antennal sockets distant (IAD/OAD > 1.2). Frontal line carinate, ending 1.5–2 OD below median ocellus. Pedicel shorter than F1. F2 length 1.9–2.1X F1. F2–F10 elongate (length/width ratio = 1.86–2.08). Metapostnotum with dorsal surface relatively short (MMR ratio = 1.20–1.33), posterior margin sharply angled onto posterior surface.

Terminalia. S7 with median lobe columnar, apex rounded (Fig. 43). S8 with apicomedial margin weakly convex (Fig. 43). Genital capsule as in Fig. 43. Gonobase with ventral arms narrowly separated. Gonostylus small. Retrorse lobe elongate, attenuated apically.

Range. Wisconsin to Georgia (Fig. 44). **USA**: GA, IL, IN, NC, NY, WI, WV.

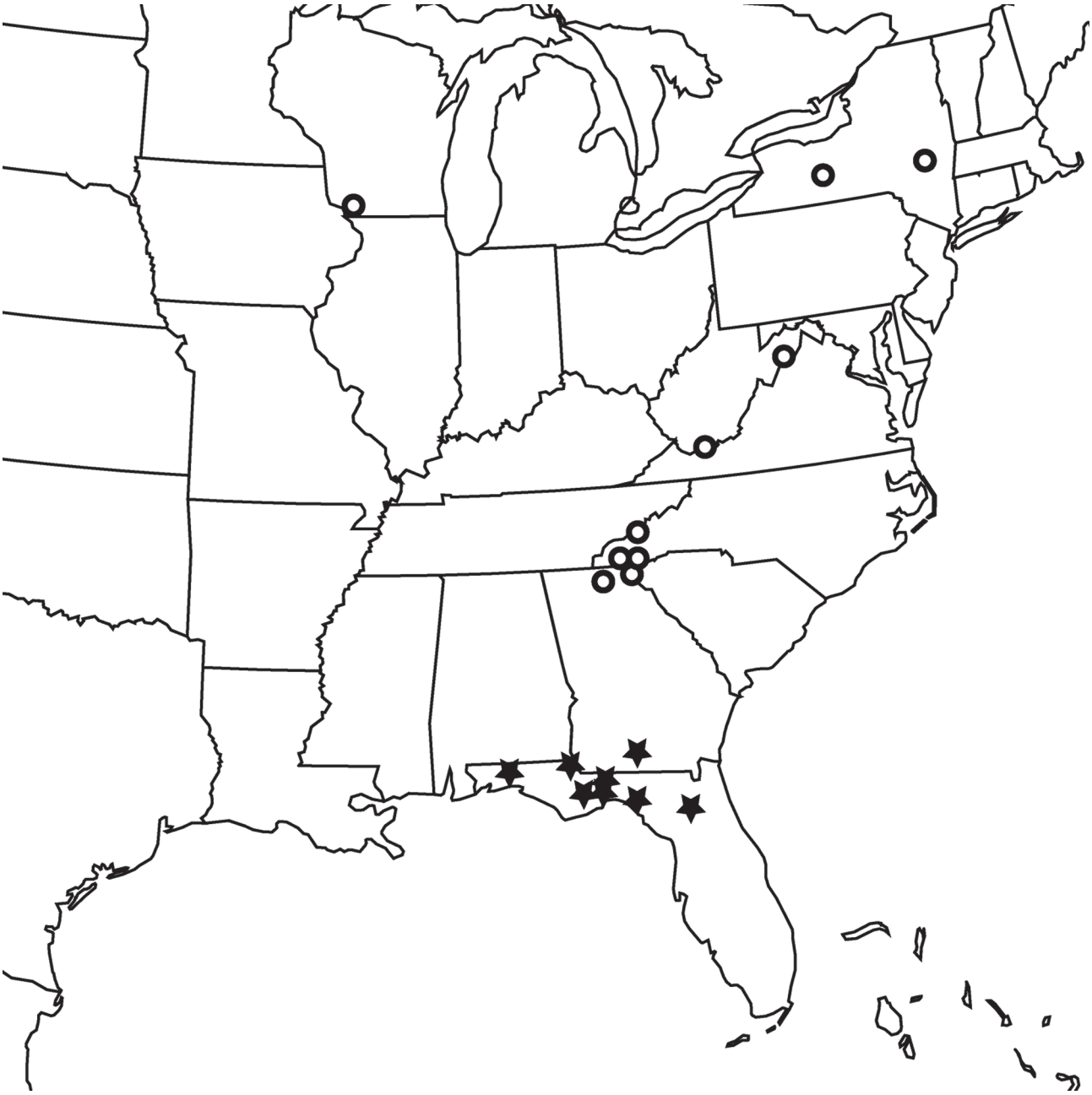

FIGURE 44. Distribution map of *Lasioglossum abanci* (circles) and *L. alachuense* (stars).

Additional material examined. USA: GEORGIA: 1♂ Rabun Bald, 9.viii.1957 (L.A. Kelton); [CNC]; 1♀ Rabun Bald, 2.vii.1938 (P.W. Fattig); 1♀ Sarah, 2.vi.1945 (P.W. Fattig); 1♀ Wayah Bald, 11.vii.1938 (T.B. Mitchell); [NCSU]; ILLINOIS: 1♀ Urbana, 14.iv.1907; [INHS]; INDIANA: 1♀ Porter Co., Indiana Dunes N.L., Howe's prairie, N41°39′09″ W087°4′15″, 5.viii.2004 (R. Grundel); [IDNL]; NEW YORK: 1♀ Albany Co., Rensselaerville, N42.51611 W074.13833, 21.vi.2008, (M.A. Rozen); [AMNH]; 4♀♀ Tompkins Co., Ithaca vicinity, Carter Creek Rd., 15.vi.1997 (B.N. Danforth); [CUIC]; NORTH CAROLINA: 1♀ Base of Wayah Bald, 10.viii.1957 (W.R. Richards); 1♀ Highlands, 6.v.1957 (W.J. Brown); 1♀ Highlands, 1.vii.1957 (J.R. Vockeroth); 1♂ Highlands, 9.viii.1957 (L.A. Kelton); [CNC]; 2♀♀ Highlands, 23.vii.1958 (T.B. Mitchell); [NCSU]; WEST VIRGINIA: 5♀♀ Tazewell Co., 1 mi. S. Bluefield, 6.vi.1976 (A. Lindsey); [CUIC];; 2♀♀ Hardy Co., Lost River S.P., 24.vi.1951 (K.V. Krombein); [NCSU]; WISCONSIN: 3♀♀ Grant Co., T6N, R6W, S17, 12–19.vii.1976, Gypsy Moth-M.T. [IRCW].

Floral records. APIACEAE: *Thaspium barbinode*; ASTERACEAE: *Krigia*, *Rudbeckia*; FABACEAE: *Melilotus*; ROSACEAE: *Aruncus*, *Fragaria*, *Rubus*; RUBIACEAE: *Houstonia purpurea*.

DNA Barcode. Unavailable.

Comments. Uncommon.

The identity of *L. abanci* has been uncertain for a long time. Mitchell (1960) suggested that *L. abanci* may only be a form of *L. oblongum*. The identity of the latter species has also been uncertain and the name has been over applied in the past (Gibbs 2010b). The large range distribution attributed to *L. abanci* previously (Mitchell 1960; Moure & Hurd 1987) was in part due to misidentification of other species such as *L. oblongum*, *L. planatum*, and *L. subviridatum*. Material from near the type locality of *L. abanci* clearly match the holotype. Despite examination of many thousands of specimens of *Lasioglossum* (*Dialictus*), including many near and around the type locality, only a small number of *L. abanci* have been found in collections.

Lasioglossum (*Dialictus*) *achilleae* (Mitchell)

(Figure 45–46)

Dialictus achilleae Mitchell, 1960: 377. ♀.

Holotype. ♀ USA, North Carolina, Cruso, June 25, 1934, on *Achillea*, (T.B. Mitchell); [NCSU]. Examined.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *achilleae*, p. 462 (catalogue); Hurd, 1979: *Dialictus achilleae*, p. 1963 (catalogue); Moure & Hurd, 1987: *Dialictus achilleae*, p. 87; Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *achilleae* ♀, p. 49 (redescription, key).

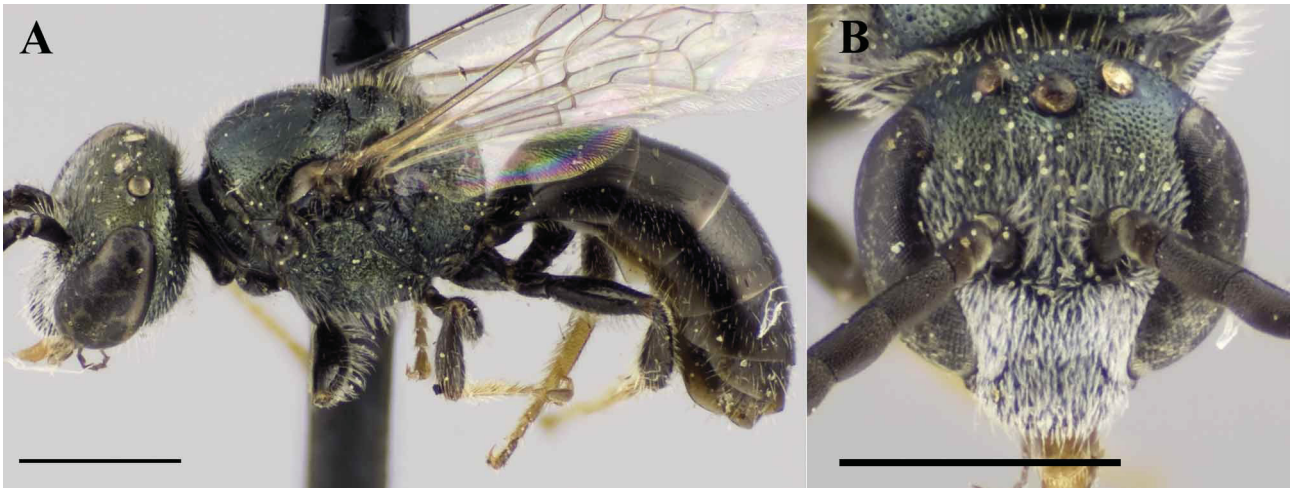

FIGURE 45. *Lasioglossum achilleae* (Mitchell) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Diagnosis. Female *L. achilleae* can be recognised by the following diagnostic combination: mesoscutum polished due to lack of microsculpture, punctures sparse throughout; propodeum with strong oblique carina; and metapostnotum delimited from posterior propodeal surface by sharp transverse angle or carina. They are most similar to *L. apopkense*, which has mesoscutum dull due microsculpture.

Male *L. achilleae* can be recognised by the following diagnostic combination: F1 short (F2:F1 ratio = 2.5–2.8); mesoscutum polished, punctures sparse throughout (Fig.46); propodeum rugose with strong oblique carina; metasomal terga sparsely punctate, impunctate on apical impressed areas; and metasomal sterna with sparse pubescence. They are most similar to *L. apopkense*, *L. lineatulum*, and *L. novascotiae*. Male *L. apopkense* have mesoscutum dull due to strong microsculpture. Male *L. lineatulum* have F1 longer (F2:F1 ratio = 1.6–1.8) and more abundant sternal hairs. Male *L. novascotiae* have head longer and denser punctures on metasomal terga.

Description. MALE. Similar to female (see Gibbs 2010b) except for the usual secondary sexual characters and as follows. Length 4.50–4.56 mm; head length 1.25–1.45 mm; head width 1.33–1.53 mm; forewing length 3.62–3.80 mm.

Colouration. Flagellum with ventral surface reddish brown. Pterostigma pale brownish yellow. Legs brown, except tarsi pale brownish yellow.

Pubescence. Face below eye emargination with relatively dense tomentum partially obscuring surface, denser on lower paraocular area. Metasomal sterna sparsely pubescent, S3–S4 with small apicolateral tufts (1 OD).

Surface sculpture. Mesoscutum polished, microsculpture faint; punctation sparse between parapsidal lines (i=1–3d) and laterad of parapsidal line (i=1–2d). Propodeal dorsolateral slope coarsely rugose. T2 apical impressed area impunctate.

Structure. Head wide (length/width ratio = 0.94–0.95). Eyes strongly convergent below (UOD/LOD ratio = 1.48–1.68). Clypeus 2/3 below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets distant (IAD/OAD > 1.0). Frontal line carinate, ending 1.5 OD below median ocellus. Pedicel subequal to F1. F2 length 2.5–2.8X F1. F2–F10 elongate (length/width ratio = 1.50–1.83). Metapostnotum moderately elongate (MMR ratio = 1.20–1.27), posterior margin sharply angled onto posterior propodeal surface.

Terminalia. Not examined.

Range. Southern Ontario south to south to Georgia. **USA**: GA, MA, MI, NC, NY. **CANADA**: ON.

Additional specimens examined. USA: NEW YORK: 1♀3♂♂ Albany Co., Colonie, 20.viii.1969, pine barrens, (G. & K. Eickwort); [CUIC].

DNA Barcode. Available. Single sequence.

Comments. Uncommon.

FIGURE 46. *Lasioglossum achilleae* (Mitchell) male, dorsal view of mesosoma.

Lasioglossum (*Dialictus*) *admirandum* (Sandhouse)

Halictus (*Chloralictus*) *admirandus* Sandhouse, 1924: 14. ♀.

Holotype. ♀ USA, Woods Hole, Massachusetts (E. Cattell), [NMNH: 26405]. Examined.

Dialictus perspicuus Knerer and Atwood, 1966a: 883. ♀ ♂.

Holotype. ♀ CANADA, Ontario, Iona, Elgin Co., 15.ix.1963 on *Solidago*, (G. Knerer); [ROM: 83647]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *admirandum* p. 1111 (catalogue); Mitchell, 1960: *Dialictus admirandus* ♀, p. 377 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *admirandum*, p. 462 (catalogue); Hurd, 1979: *Dialictus admirandus*, p. 1963, *D. perspicuus*, p. 1970 (catalogue); Moure & Hurd, 1987: *Dialictus admirandus*, p.

88, *D. perspicuus*, p. 121 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *admirandum* ♀♂, p. 52 (redescription, key, synonymy).

Diagnosis. Female *L. admirandum* can be recognised by the following diagnostic combination: head moderately elongate (length/width ratio = 0.95–1.01); clypeus with apicolateral margins convergent (Fig. 21A); mesoscutum densely tessellate, punctures sparse between parapsidal lines (i=1–3d); tegula pale translucent brownish yellow; mesepisternum weakly rugulose; metapostnotal rugae not reaching posterior margin; T1 acarinarial fan with dorsal opening; T1 anterior declivitous portion polished due to lack of microsculpture; metasomal terga brown, distinctly punctate throughout; and T3–T4 with abundant tomentum. They are most similar to *L. paradmirandum* and *L. sagax*. Female *L. paradmirandum* have mesepisternum tessellate and T1 declivitous portion distinctly coriarious. Female *L. sagax* have apical half of T2 nearly impunctate.

Male *L. admirandum* are similar to females except with head elongate (length/width ratio = 1.01–1.04); clypeus with yellow distal band; face with abundant tomentum obscuring surface below; flagellomeres elongate (length/width ratio = 1.57–1.82), yellow ventrally; tibial apices and bases with extensive yellow; and apical impressed areas of metasomal terga impunctate. They are most similar to *L. sagax*, which has mesoscutum relatively polished due to weak microsculpture.

Range. Ontario south to Georgia, west to Saskatchewan, Minnesota. **USA**: CT, IN, MA, MD, MI, MN, NY, WI. **CANADA**: ON, SK.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon. Gibbs (2010b) reported a smaller range for *L. admirandum* but additional material has since been identified from CUIC.

Most *L. admirandum* have the head and mesosoma primarily green but some individuals have stronger blue reflections. The holotype of *H. admirandus* belongs to the latter category whereas the holotype of *D. perspicuus* is a green form.

Lasioglossum (*Dialictus*) *alachuense* (Mitchell)

(Figure 47–50)

Dialictus alachuensis Mitchell, 1960: 378. ♀.

Holotype. ♀ USA, Florida, Alachua Co., 20.ix.1955 (H.V. Weems, Jr.); [FSCA]. Examined.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *alachuense*, p. 462 (catalogue); Moure and Hurd, 1987: *Dialictus alachuensis*, p. 88 (catalogue).

Diagnosis. Female *L. alachuense* can be recognised by the following diagnostic combination: apical half of clypeus brown to reddish-orange; mesoscutum imbricate-tessellate, punctures sparse between parapsidal lines (i=1–2.5d) (Fig. 48); mesepisternum rugulose; tegula pale yellow; metatibia with extensive orange-yellow (Fig. 47A); metapostnotal rugae relatively fine; T1 fan with wide dorsal opening (Fig. 48); and metasoma terga blackish brown with no appressed tomentum. They are superficially similar to *L. leviense*, which has sparse tomentum on metasomal terga.

Male *L. alachuense* can be recognised by the combination of clypeus with distal margin yellow (Fig. 49B); mesoscutum imbricate, punctation sparse between parapsidal lines (i=1–2.5d) (Fig. 50); mesepisternum finely rugulose-imbricate; tegula pale yellow; tibiae and tarsi almost entirely brownish yellow; metasomal terga without tomentum, apical impressed areas impunctate; and S4–S5 with apicolateral hairs. They are most similar to *L. leviense* which are smaller, more finely rugulose on mesepisternum, and tibiae less extensively brownish yellow.

Redescription. FEMALE. Length 4.23–5.02 mm; head length 1.27–1.43 mm; head width 1.32–1.51 mm; forewing length 3.33–3.69 mm.

Colouration. Head and mesosoma pale green to blue. Clypeus with apical half blackish brown to reddish orange. Antenna dark brown, flagellum with ventral surface reddish brown. Tegula pale yellow. Wing membrane subhyaline, venation and pterostigma yellowish brown. Legs brown except tarsi, and apical and basal portions of tibiae yellow to amber, pro- and metatibiae sometimes with more extensive pale colouration. Metasoma dark brown, terga and sterna with apical margins translucent brownish yellow.

FIGURE 47. *Lasioglossum alachuense* (Mitchell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 48. *Lasioglossum alachuense* (Mitchell) female, dorsal view of mesosoma.

Pubescence. Dull white. Moderately sparse. Head and mesosoma with moderately sparse woolly hairs (1–2 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena with sparse subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately sparse, fine hairs. T1 acarinarial fan limited to small lateral area, dorsal opening wider than lateral patches. T1–T6 without tomentum. T2 apicolateral and T3–T4 apical margins with sparse fringes.

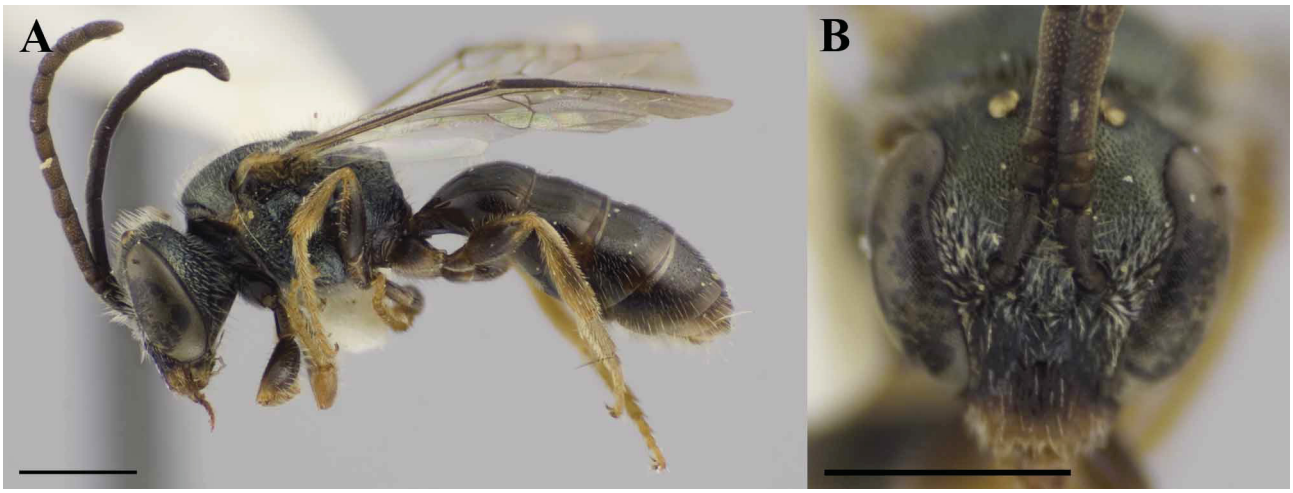

FIGURE 49. *Lasioglossum alachuense* (Mitchell) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Surface sculpture. Face imbricate, punctation fine. Clypeus with apical half polished, punctation sparse (i=1–3d). Supraclypeal area with punctation moderately sparse (i=1–2d). Lower paraocular area punctation dense (i≤d). Antennocular area punctation moderately dense (i=1–1.5d). Upper paraocular area and frons punctate-reticulate. Ocellocular area obscurely punctate (i=d). Gena obscurely lineolate. Postgena weakly imbricate. Mesoscutum weakly imbricate, punctation moderately sparse between parapsidal lines (i=1–2.5d), dense laterad of parapsidal line (i≤d), contiguous on anterolateral portion. Mesoscutellum similar to mesoscutum, submedial punctation sparse (i=1.5–3d). Axilla minutely punctate. Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate-rugulose. Mesepisternum dorsal half rugulose, ventral half ruguloso-imbricate. Metepisternum with upper half carinulate and ventral portion imbricate. Metapostnotum incompletely carinulate, posterior margin imbricate. Propodeum with dorsolateral slope imbricate, lateral surface tessellate-imbricate, posterior surface imbricate. Metasomal terga polished, punctation moderately dense basally (i=1–1.5d), more widely spaced apically (i=1–2.5d).

Structure. Head very wide (length/width ratio = 0.94–0.96). Eyes convergent below (UOD/LOD ratio = 1.29–1.30). Clypeus ½ below suborbital tangent, apicolateral angle convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2–2.5 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–5 branches. Metapostnotum not truncate (MMR ratio = 1.00–1.14), posterior margin narrowly rounded onto posterior surface. Propodeum with oblique carina absent, lateral carina not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 4.75–4.88 mm; head length 1.45–1.48 mm; head width 1.50 mm; forewing length 4.13–4.19 mm.

Colouration. Labrum, mandible, and distal margin of clypeus brownish yellow. Flagellum with ventral surface reddish brown. Tegula brownish yellow. Legs brown, except tibiae mostly yellowish brown, tarsi pale brownish yellow.

Pubescence. Face below eye emargination with moderately dense tomentum partially obscuring surface. Metasomal sterna sparsely pubescent, S4–S5 with apicolateral tufts (1.5 OD).

Surface sculpture. Mesoscutum imbricate, punctation sparse between parapsidal lines (i=1–2.5d) and dense laterad of parapsidal line (i≤1d). Metapostnotum with coarse longitudinal rugae, separated by wide smooth interstitial regions. Propodeal dorsolateral slope coarsely rugose. T2 apical impressed area impunctate.

Structure. Head wide (length/width ratio = 0.97–0.98). Eyes strongly convergent below (UOD/LOD ratio = 1.57–1.59). Clypeus 2/3 below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets distant (IAD/OAD > 1.5). Frontal line carinate, ending 1.5 OD below median ocellus. Pedicel shorter than F1. F2 length 1.9X F1. F2–F10 elongate (length/width ratio = 1.73–1.90). Metapostnotum moderately elongate (MMR ratio = 1.13–1.17), posterior margin sharply angled onto posterior propodeal surface.

Terminalia. Not examined.

Range. South-eastern USA (Fig. 44). **USA**: FL, GA.

Additional material examined. USA: FLORIDA: 3♀♀1♂ Leon Co., Apalachicola National Forest, FS366, LLP, N30.19751 W084.30309, 11–18.vii.2005 (Ronquist Lab); [AMNH]; 1♀ *paratype* Alachua Co., 20.ix.1955; 1♀ Alachua Co., 20.ix.1955; 2♀♀ Liberty Co., 2.3 mi W. Hosford, Rt. 20, 13.vii.1979 (A. Lindsey); 2♀♀ Liberty Co., Torreya S.P.,

25.iii.1986 (B. Alexander); 1♀2♂♂ Oklaoosa Co., Rd. 232 at Turkey Creek, 4.x.1966 (P.A. Thomas); 2♀♀ Taylor Co., 5.x.1960 (F.W. Head); [CUIC]; 2 ♀♀ Wakulla Co., Apalachicola N.F., Hwy 65, Post Office Bay, N30˚3.565′ W084˚59.051′, 29.v–4.vi.2005 (A. Vanderby); 5 ♀♀ Wakulla Co., Apalachicola N.F., Hwy 65, Post Office Bay, N30˚3.565′ W084˚59.051′, 13–20.vi.2005 (Ronquist lab); 11 ♀♀ Wakulla Co., Apalachicola N.F., Hwy 65, Post Office Bay, N30˚3.565′ W084˚59.057′, 20–27.vi.2005 (Ronquist lab); 6 ♀♀ Wakulla Co., Apalachicola N.F., Hwy 65, Post Office Bay, N30˚3.565′ W084˚59.051′, 27.vi–5.vii.2005 (A. Vanderby); 2 ♀♀ Wakulla Co., Apalachicola N.F., FS 366, N30˚19.751′ W084˚30.309′, 5–11.vii.2005 (Ronquist lab); 1 ♀♀ Wakulla Co., Apalachicola N.F., FS Road 390, N30˚21.696′ W084˚49.399′, 11–18.vii.2005 (Ronquist lab); [PCYU]; GEORGIA: 1♀ Cook Co., Reed Bingham S.P., 29.iii.1974 (G.C. Eickwort); [CUIC].

Floral records. APIACEAE: *Oxypolis filiformis*.

DNA Barcode. Available. Multiple sequences. See comments.

Comments. Uncommon.

DNA barcodes do not distinguish *L. alachuense* from *L. oblongum*. The two species are closely related but differ by multiple characters of surface sculpture and colour.

FIGURE 50. *Lasioglossum alachuense* (Mitchell) male, dorsal view of mesosoma.

Lasioglossum (*Dialictus*) *albipenne* (Robertson)

Halictus albipennis Robertson, 1890: 317. ♀♂.

Lectotype. ♀ USA, Illinois, [Carlinville] (C. Robertson); [ANSP: 4251] designated herein. Examined.

Halictus nubilis Lovell, 1905a: 40. ♀.

Lectotype. ♀ USA, Maine, Waldoboro, 2.viii. (J.H. Lovell); [NMNH: 71570] designated herein. Examined.

Halictus (*Chloralictus*) *lactineus* Sandhouse, 1924: 34. ♀.

Holotype. ♀ USA, Colorado, Boulder, 4.viii.1908 (S.A. Rohwer); [NMNH: 26435]. Examined.

Halictus (*Chloralictus*) *basilicus* Sandhouse, 1924: 36. ♂.

Holotype. ♂ USA, Connecticut, Colebrook, 1–7.ix., (W.M. Wheeler); [NMNH: 26439]. Examined.

Taxonomy. Robertson, 1902b: *Chloralictus albipennis*, p. 249 (key); Viereck, 1916: *Halictus* (*Chloralictus*) *albipennis*, p. 707 (key); Michener, 1951: *Lasioglossum* (*Chloralictus*) *albipenne*, p. 1111, *L.* (*C.*) *basilicum*, p. 1112, *L.* (*C.*) *lactineum*, p. 1114 (catalogue); Mitchell, 1960: *Dialictus albipennis* ♀♂, p. 378, *D. basilicus* ♂, 383 (redescription); Knerer and Atwood, 1966a: *Dialictus basilicus* ♀, p. 881 (description); Krombein, 1967: *Lasioglossum* (*Dialictus*) *albipenne*, p. 462, *L.* (*D.*) *basilicum*, p. 462 (catalogue); Hurd, 1979: *Dialictus albipennis*, p. 1963, *D. basilicus*, p. 1964, *D. lactineus*, p. 1967 (catalogue); Moure & Hurd, 1987: *Dialictus albipennis*, p. 88, *D. basilicus*, p. 92, *D. lactineus*, p. 109 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *albipenne* ♀♂, p. 57 (redescription, key, synonymies).

Diagnosis. Female *L. albipenne* can be recognised by the following diagnostic combination: head and mesosoma bluish; wings white, pterostigma and venation pale yellow; hypostomal carinae parallel, unreflexed; mesoscutal punctures coarse, sparse between parapsidal lines (i=1–3d); mesepisternum coarsely reticulate-rugose; propodeum strongly carinate; T1 acarinarial fan large without dorsal opening; and metasomal terga brown with dense tomentum, distinctly punctures throughout. They are most similar to *L. cressonii*, *L. disparile*, and *L. nymphaearum*. Female *L. cressonii* have the head and mesosoma golden green, mesoscutal punctures relatively dense (i=1–1.5d) and wings faintly dusky. Female *L. disparile* have a distinct glabrate band on the declivitous surface of T1 separating the acarinarial fan from a dorsal hair band. Female *L. nymphaearum* have hypostomal carina reflexed distally and propodeal dorsal and posterior surfaces separated by uninterrupted transverse carina.

Male *L. albipenne* are similar to females except for the following: head elongate (length/width ratio = 0.99–1.08); face obscured by abundant white hairs; flagellomeres short (length/width ratio = 1.21–1.31), bright yellow ventrally; and mesepisternum punctate-reticulate. They are most similar to *L. pruinosum* and *L. nymphaearum*. Male *L. pruinosum* have the clypeus with distal yellow maculation. Male *L. nymphaearum* have tegula distinctly punctate.

Range. Nova Scotia west to British Columbia, south to North Carolina, Colorado and Oregon. **USA**: CO, CT, IL, IA, KS, MA, ME, MI, MN, ND, NE, NH, NJ, NY, SD, TN, VT, WI, WV. **CANADA**: AB, BC, MB, NB, NS, ON, PE, SK.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Variation in the strength of the female propodeal carinae can be seen in long series. Individuals with weaker carinae have been treated as separate species (Knerer & Atwood 1966a).

The specimen of *Halictus albipennis* indicated above is designated herein as the lectotype to ensure future stability in the application of the name. Some of Robertson's syntype series include more than one species, which could potentially lead to taxonomic confusion. An invalid lectotype led Gibbs (2010b) to treat the name *Halictus nymphaearum* as a junior subjective synonymy of *L. albipenne* (for discussion see Gibbs 2010b, below). Other subjective synonymies have also recently been made (Gibbs 2010b). The specimen of *Halictus nubilis* indicated above is designated herein as the lectotype to ensure future stability in the application of the name.

Lasioglossum (*Dialictus*) *anomalum* (Robertson)

Halictus anomalus Robertson, 1892: 272. ♀.

Lectotype. ♀ USA, Illinois, Macoupin Co., Carlinville, 19.v.1891 (C. Robertson); [INHS: 11111] by W. E. LaBerge (in Webb 1980). Examined.

Taxonomy. Robertson, 1902a: *Dialictus anomalus* ♂, p. 48 (description); Sandhouse, 1923: *Dialictus anomalus*, p. 193 (key); Michener, 1951: *Lasioglossum* (*Dialictus*) *anomalum*, p. 1119 (catalogue); Mitchell, 1960: *Dialictus anomalus* ♀♂, p. 379 (redescription, key); Krombein, 1967: *Lasioglossum* (*Dialictus*) *anomalum*, p. 462 (catalogue); Hurd, 1979: *Dialictus anomalus*, p. 1964 (catalogue); Moure & Hurd, 1987: *Dialictus anomalus*, p. 89 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *anomalum* ♀♂, p. 66 (redescription, key).

Diagnosis. Both sexes of *L. anomalum* can be recognised by the absence of vein 1rs-m resulting in two submarginal cells. Some individuals of *L. lionotum* also have two submarginal cells but are easily distinguished by their parasitic characteristics (see diagnosis for *L. lionotum* below). *Lasioglossum anomalum* are small, with mesoscutal punctures sparse between parapsidal lines, mesepisternal with contiguous punctures, T2 impunctate on apical half (except along premarginal line), and metasomal terga without tomentum. Male *L. lionotum* have the flagellomeres short (length/width ratio = 1.09–1.25), and gonostylus with elongate, medially directed hairs.

Range. Ontario west toColorado, south to Alabama. **USA**: AL, CO, CT, GA, IL, IN, IA, MA, MI, MN, MO, NC, NE, NY, VT, WI. **CANADA**: ON.

DNA Barcode. Available. Multiple sequences.

Comments. Common. Gibbs (2010b) reported a less southerly range for *L. anomalum* but additional material has since been identified from CUIC.

Lasioglossum anomalum is the type species for *Dialictus*.

Several individuals of *L. anomalum* with three submarginal cells in one or both wings have been examined (Gibbs 2010c), including one of the paratypes at INHS.

Lasioglossum (*Dialictus*) *apocyni* (Mitchell)

(Figures 51–55)

Dialictus apocyni Mitchell, 1960: 381. ♀.

Holotype. ♀ USA, West Virginia, Raleigh Co., 6.vi.1955, on *Apocynum cannabinum*; (H.V. Weems, Jr.); [FSCA]. Examined.

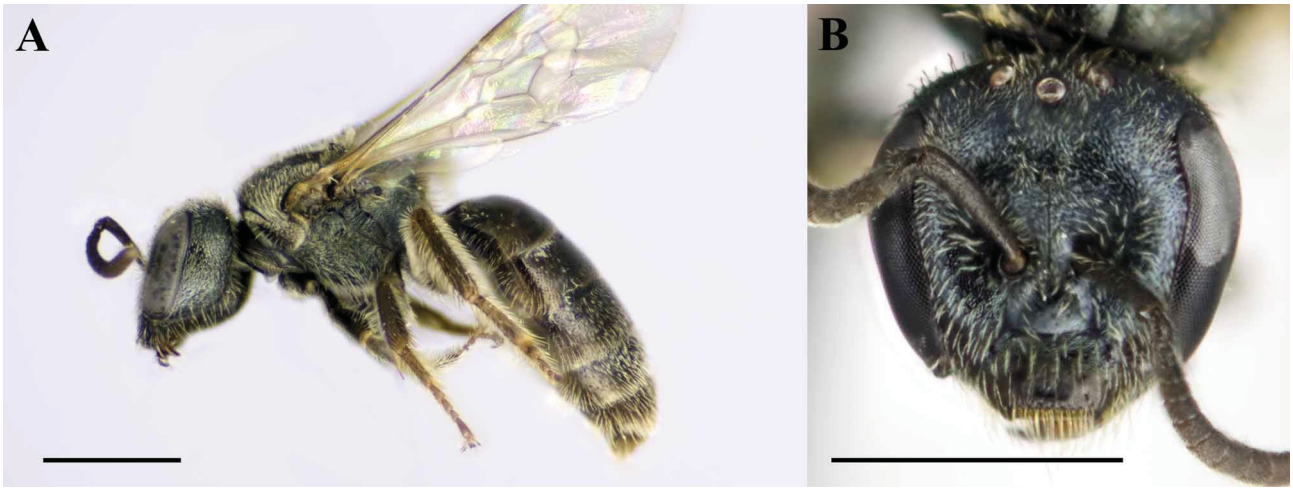

FIGURE 51. *Lasioglossum apocyni* (Mitchell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *apocyni*, p. 462 (catalogue); Moure and Hurd, 1987: *Dialictus apocyni*, p. 90 (catalogue).

Diagnosis. Female *L. apocyni* can be recognised by the following diagnostic combination: clypeus flat, gena wider than eye (Fig. 51A), hypostomal carinae parallel, and T1 acarinarial fan open dorsally (Fig. 52). In unworn specimens, the mandible extends beyond the opposing clypeal angle. They are most similar to *L. katherineae* and *L. fattigi*, both of which have clypeus less flat, gena subequal to eye, and in *L. katherineae* T1 acarinarial fan complete without dorsal opening.

Male *L. apocyni* can be recognised by the combination of head elongate (length/width ratio = 1.06–1.07); supraclypeal area longer than wide; pronotal ridge strong but rounded; mesoscutum entirely imbricate, punctation sparse between parapsidal lines (Fig. 54); metapostnotum posterior margin rounded onto posterior declivitous surface; and metasomal terga with apical impressed areas impunctate. They are most similar to male *L. fattigi*, which have mesoscutum polished submedially.

FIGURE 52. *Lasioglossum apocyni* (Mitchell) female, dorsal view of mesosoma.

FIGURE 53. *Lasioglossum apocyni* (Mitchell) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Description. FEMALE. Length 3.87–5.08 mm; head length 1.37–1.58 mm; head width 1.39–1.61 mm; forewing length 3.03–3.63 mm.

Colouration. Head and mesosoma pale golden green, sometimes bluish. Clypeus with apical half blackish brown, basal half and supraclypeal area sometimes golden. Antenna dark brown, flagellum with ventral surface dark reddish brown. Tegula pale reddish brown to brownish yellow. Wing venation and pterostigma pale brownish yellow. Legs brown, except medio- and distitarsi reddish brown. Metasoma brown, terga and sterna with apical margins translucent brownish yellow.

FIGURE 54. *Lasioglossum apocyni* (Mitchell) male, dorsal view of mesosoma.

Pubescence. Dull white. Moderately sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Lower paraocular area and gena with virtually no tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with sparse, fine hairs. T1 acarinarial fan with narrow dorsal opening, not wider than lateral hair patches. T2–T3 basolaterally and T4 entirely with sparse tomentum not obscuring surface. T2 apicolateral and T3–T4 apical margins with sparse apical fringes.

Surface sculpture. Face weakly imbricate, punctation fine. Clypeus polished, punctation sparse (i=1–4d). Supraclypeal area with punctation sparse (i=1–4d). Lower paraocular and antennocular areas with punctation relatively sparse (i=1–2.5d). Upper paraocular area and frons contiguously punctate. Ocellocular area minutely, obscurely punctate (i=1–1.5d). Gena weakly lineolate. Postgena weakly imbricate. Mesoscutum weakly tessellate-imbricate, punctation fine, moderately sparse between parapsidal lines (i=1–2d), dense laterad of parapsidal line (i≤d), and reticulate on anterolateral portion. Mesoscutellum similar to mesoscutum, submedial punctation sparse (i=1–3d). Axilla punctate. Metanotum imbricate. Preëpisternum weakly rugulose. Hypoepimeral area imbricate. Mesepisternum weakly rugulose. Metepisternum dorsal ½ carinulate, lower ½ imbricate. Metapostnotum incompletely rugoso-carinulate, posterior margin tessellate-imbricate. Propodeum with dorsolateral slope imbricate, carinulate basally, lateral and posterior surfaces tessellate. Metasomal terga coriarious, T1 anterior surface with distinct microsculpture, punctation on basal halves moderately dense (i=1–1.5d), obscure and scattered on apical halves (i=2–2.5d), T1 dorsal portion and T2 apical half virtually impunctate.

Structure. Head round (length/width ratio = 0.98–0.99). Eyes weakly convergent below (UOD/LOD ratio = 1.11–1.18). Mandible often extending beyond opposing clypeal angle. Clypeus flat, ½ below suborbital tangent, apicolateral margins strongly convergent. Antennal sockets moderately close (IAD/OAD < 0.6). Frontal line carinate, ending 2.5OD below median ocellus. IOD subequal to OOD. Gena wider than eye. Pronotal ridge strong, acarinate. Inner metatibial spur pectinate with 3 branches. Metapostnotum moderately elongate (MMR ratio = 1.40), posterior margin rounded onto posterior surface. Propodeum with oblique carina virtually absent, lateral carina weak, reaching halfway to dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length. 4.30–5.26 mm; head length. 1.32–1.49 mm; head width. 1.25–1.39 mm; forewing length. 2.96–3.32 mm.

Colouration. Flagellomeres with ventral surface orange-yellow. Legs brown, except tarsi brownish yellow.

Pubescence. Lower paraocular area with tomentum partially obscuring surface. Clypeus with scattered tomentum not obscuring surface. Gena with sparse tomentum. S3–S5 with apicolateral patches of appressed hairs.

Surface sculpture. Clypeal punctation relatively dense (i=1–1.5d). Metanotum rugose. Preëpisternum and hypoepimeral area rugulose. Metapostnotum with moderately strong rugae nearly reaching posterior margin. Propodeum with dorsolateral slope rugose, lateral and posterior surfaces ruguloso-imbricate. Metasomal terga polished, punctation moderately dense (i=1–2d) nearly reaching premarginal line, apical impressed areas impunctate.

Structure. Head elongate (length/width ratio = 1.06–1.07). Eyes strongly convergent below (UOD/LOD ratio = 1.58–1.67). Supraclypeal area below antennal sockets longer than wide (length/width ratio = 1.2). Antennal sockets distant (IAD/OAD > 1.4). Frontal line carinate, ending 2OD below median ocellus. Pedicel shorter than F1. F2 length 1.7X F1. F2–F10 moderately elongate (length/width ratio = 1.64–1.81). Propodeum dorsal surface moderately elongate (MMR ratio = 1.26), posterior margin rounded onto posterior surface.

Terminalia. Genital capsule as in Fig. 55. Gonobase with ventral arms widely separated. Gonostylus small, dorsal setae elongate. Retrorse lobe elongate, attenuated apically.

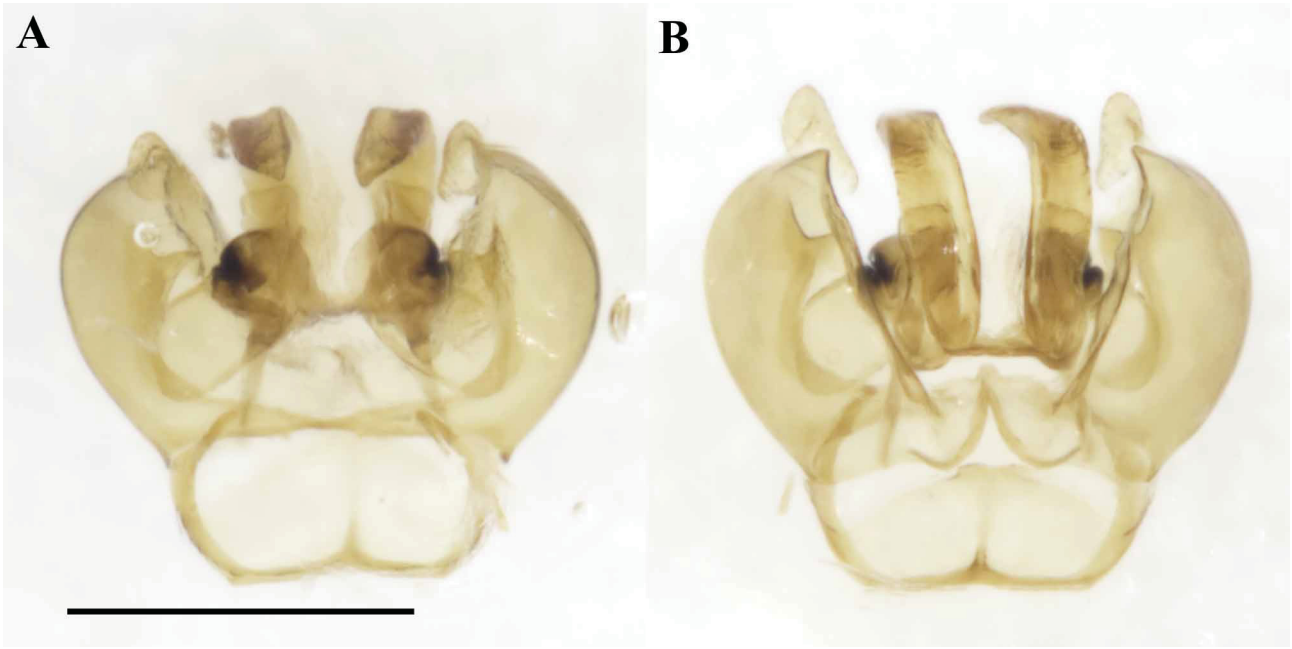

FIGURE 55. *Lasioglossum apocyni* (Mitchell) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

Range. Indiana to West Virginia, south to Tennessee (Fig. 56). **USA**: IL, IN, KY, MS, OH, TN, VA, WV.

Additional material examined. USA: ILLINOIS: 1♀ Cook Co., Elgin, Bluff Springs Fen, 28.vi.2010 (L. Rericha); [CUIC]; 1♀ Peoria Co., Peoria Heights, 19.viii.1968 (J.C. Marlin); 1♀ Tazewell Co., 3 mi N. Mackinaw, 10.vi.1969 (Webb & Marlin); 1♀ Woodford Co., 2 mi W Metamora, 16.viii.1968 (J.C. Marlin); [INHS]; INDIANA: 1♀ Morgan-Monroe S.F., 14–16.vii.1937 (Montgomery 1937 Forest Insect Survey); [NCSU]; 1♀ Vigo Co., 11.v.1999 (R.P. Jean); [PCYU]; MISSISSIPPI: 8♀♀ Pontotoc Co., 1 mi. SE Escru, 4.vi.1981 (M.O. Mann); [CUIC]; OHIO: 2♀♀ *paratypes* Coshocton Co., 2.vi.1929 (J.S. Hine); [NCSU]; TENNESSEE: 1♀ Roane Co., 5.ix.1982 (O. Pellmyr); [CUIC]; VIRGINIA: 1♀ Eagle Rock, 18.vi.1957 (R.L. Fischer); [MSUC]; WEST VIRGINIA: 1♀ *paratype* Raleigh Co., 4.vi.1955 (H.V. Weems, Jr.); [AMNH]; 16♀♀ *paratypes* Raleigh Co., 6.vi.1955 (H.V. Weems, Jr.); [NCSU]; 1♀ *paratype* Raleigh Co., 4.vi.1955 (H.V. Weems, Jr.); [NMNH]; 2♀♀ Hampshire Co., N39.34105 W078.4641, 29–30.v.2004 (S.W. Droege); 1♀ Hampshire Co., N39.23486 W078.7442, 11.vii.2005 (S.W. Droege); 1♀ Hampshire Co., N39.27931 W078.6809, 11.vii.2005 (S.W. Droege); 3♀♀ Hampshire Co., N39.3348 W078.458, 20.x (S.W. Droege); 1♂ Hampshire Co., N39.2489 W078.5256, 9.xi.2007 (V. Schoene); 3♀♀ 2♂♂ near Charleston, N38.41211 W081.64776, 15.viii.2006 (J. Gibbs); [PCYU].

Floral records. APIACEAE: *Daucus carota*; APOCYNACEAE: *Apocynum cannabinum*; RANUNCULACEAE: *Actaea rubifolia*.

DNA Barcode. Available. Multiple sequences. DNA barcodes do not clearly distinguish *L. apocyni* from *L. fattigi* or *L. paradmirandum*.

Comments. Uncommon.

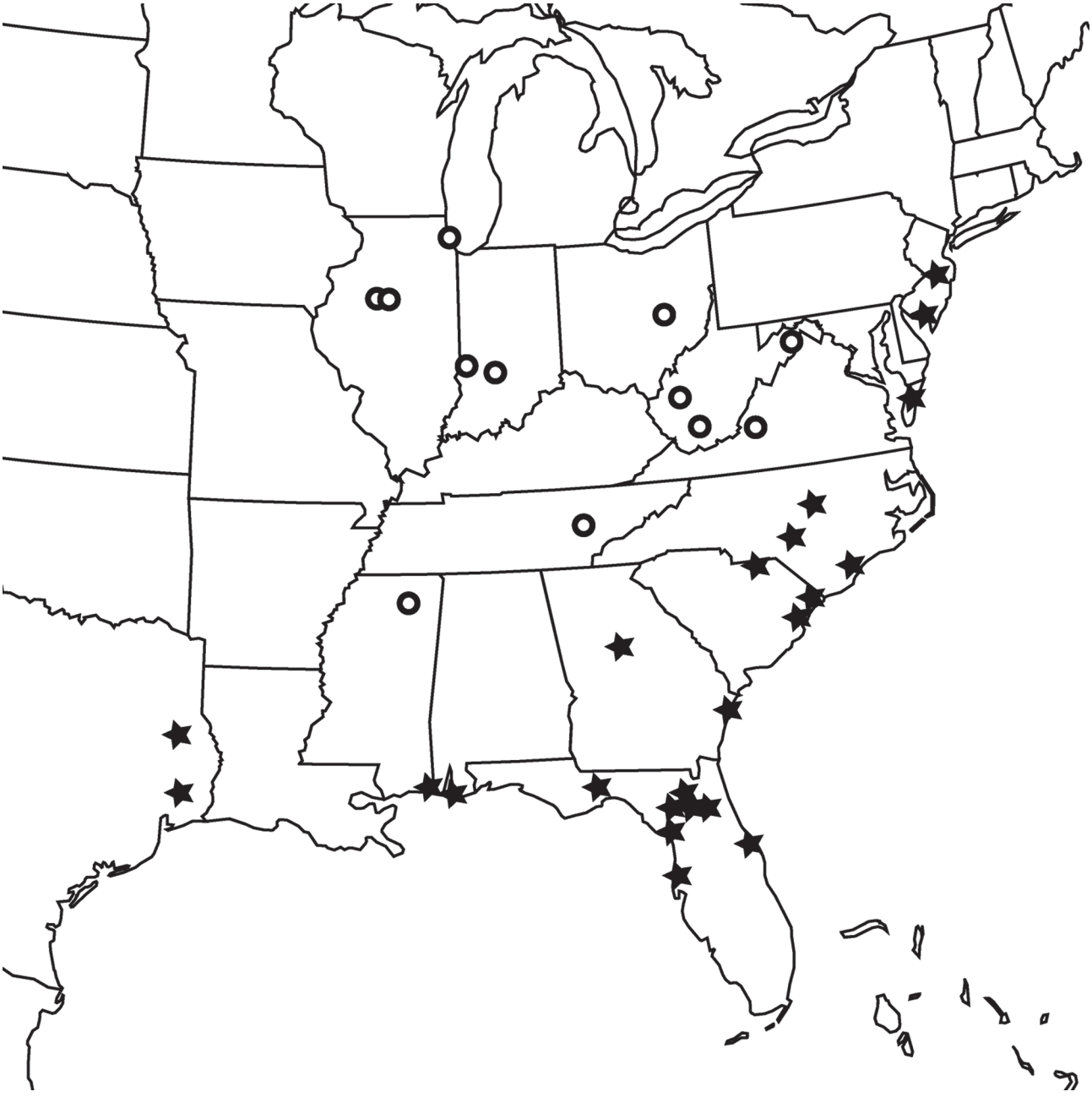

FIGURE 56. Distribution map of *Lasioglossum apocyni* (circles) and *L. apopkense* (stars).

Lasioglossum (*Dialictus*) *apopkense* (Robertson)

(Figures 57–61)

Halictus apopkensis Robertson, 1892: 272 ♀.

Lectotype. ♀ USA, Florida, Inverness, 12.ii.1891 (C. Robertson); [INHS: 9991] by W. E. LaBerge (in Webb 1980). Examined

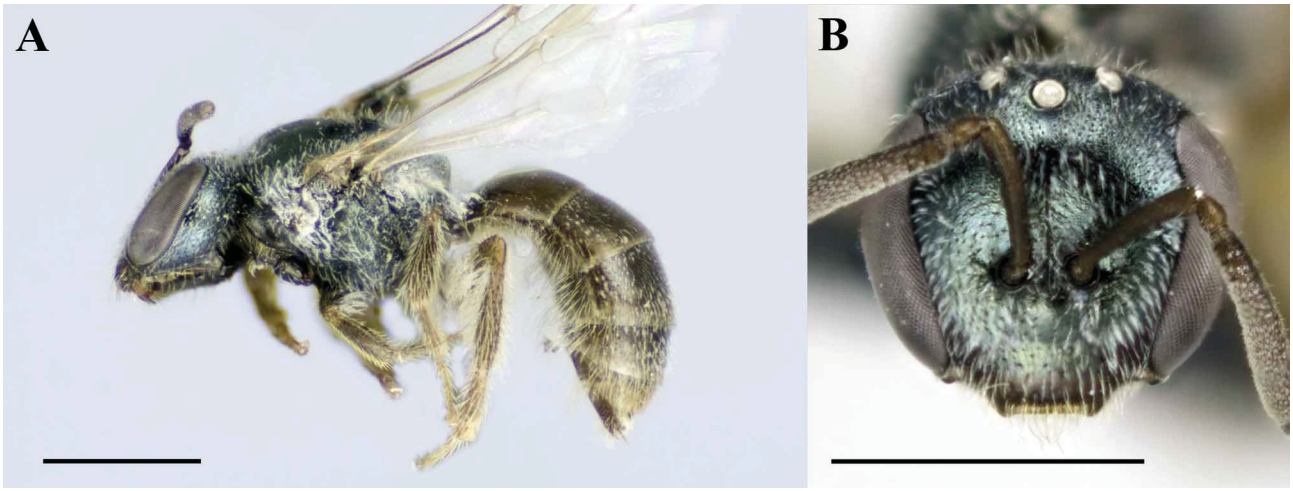

FIGURE 57. *Lasioglossum apopkense* (Mitchell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

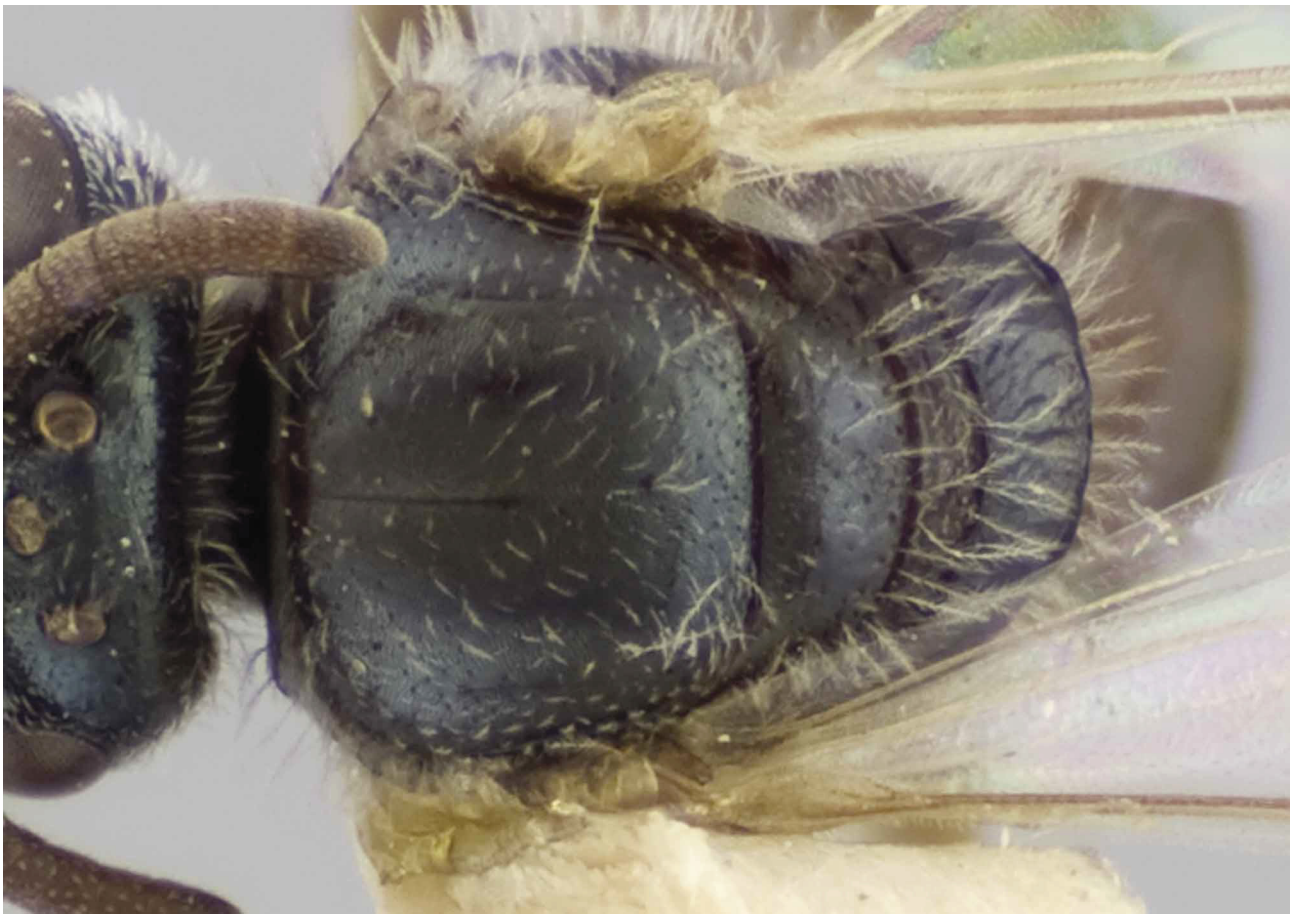

FIGURE 58. *Lasioglossum apopkense* (Mitchell) female, dorsal view of mesosoma.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *apopkense*, p. 1112 (catalogue); Mitchell, 1960: *Dialictus apopkensis*, p. 382 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *alachuense*, p. 462 (catalogue); Moure and Hurd, 1987: *Dialictus apopkensis*, p. 90 (catalogue).

Diagnosis. Both sexes of *L. apopkense* can be recognised by the following diagnostic combination: size small (3.7–4.8 mm); mesoscutum dull due to coarse microsculpture, punctation sparse throughout (Figs. 58, 60); propodeal carinae strong; and metasomal terga impunctate on apical halves. Female *L. apopkense* are most similar to *L. achilleae*, which have mesoscutum polished due to lack of microsculpture.

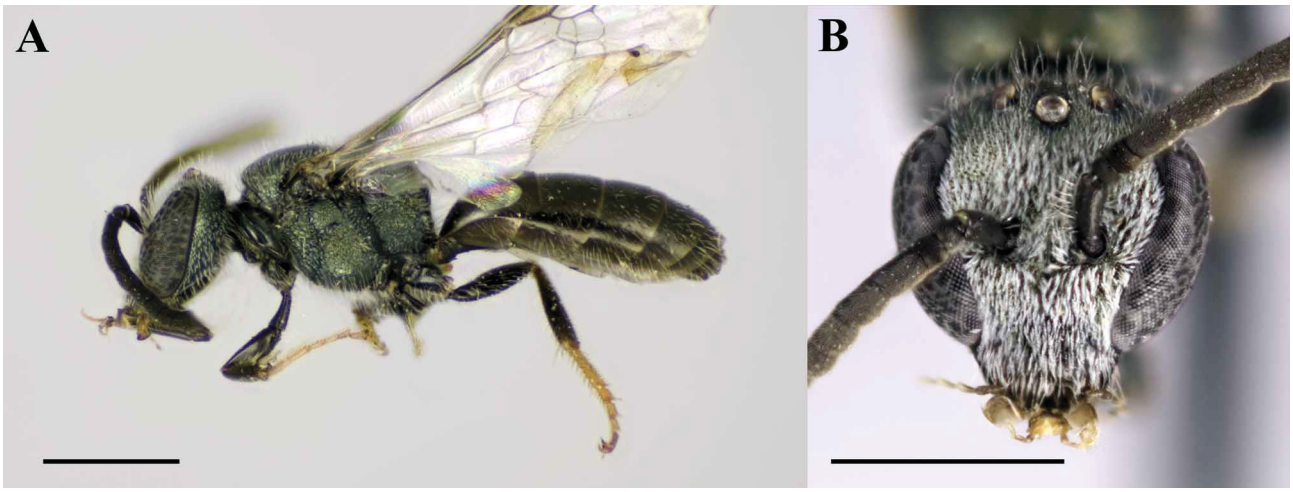

FIGURE 59. *Lasioglossum apopkense* (Mitchell) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 60. *Lasioglossum apopkense* (Mitchell) male, dorsal view of mesosoma.

Redescription. FEMALE. Length 3.66–4.80 mm; head length 1.06–1.36 mm; head width 1.15–1.46 mm; forewing length 2.66–3.51 mm.

Colouration. Head and mesoscutum pale bluish green to pale green. Mandible dark orange. Clypeus with apical half blackish brown. Antenna dark brown, flagellomeres with ventral surface reddish brown. Metapostnotum blue. Tegula pale amber. Wing venation and pterostigma pale yellow. Wing membranes hyaline with pale hairs. Legs brown, except metabasitarsus infused with reddish brown, medio- and distitarsi reddish brown. Metasoma brown, terga and sterna with apical margins reddish brown, T2–T4 apical margins translucent yellow.

Pubescence. Dull white. Mostly sparse. Head and mesosoma with sparse woolly hairs (1–2 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Lower paraocular area with tomentum. Gena with sparse tomentum. Propodeum with plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with sparse, fine hairs. T1 acarinarial fan sparse with wide dorsal opening, equal to width of lateral fan. T2–T3 basolaterally and T4 entirely with very sparse tomentum. T3–T4 with very sparse apical fringes.

Surface sculpture. Face polished, weakly imbricate, punctation moderately fine. Clypeus polished, punctation sparse (i=1–3d). Supraclypeal area with punctation sparse (i=3–5d). Lower paraocular area punctation dense (i<d). Antennocular area punctation moderately sparse (i=0.5–2d). Upper paraocular area and frons punctation moderately dense (i≤1.5d). Gena polished, finely punctate. Postgena imbricate. Mesoscutum tessellate, punctation deep and moderately sized, sparse throughout (i=1–4d), moderately sparse laterad to parapsidal line (i=2d) and anterolateral area (i=1–2d). Mesoscutellum similar to mesoscutum, submedial area punctures sparse (i=2–4d). Axilla punctate. Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate. Mesepisternum ruguloso-imbricate above, lower half imbricate with obscure punctation (i=1–2d). Metepisternum upper half rugoso-carinulate, lower half imbricate. Metapostnotum coarsely rugoso-carinulate, interstitial areas weakly imbricate. Propodeum dorsolateral slope, lateral and posterior surfaces imbricate-tessellate. Metasomal terga polished except apical impressed areas coriarious. T1 largely impunctate. T2–T4 punctation sparse basally (i=1–3d), apical half impunctate (except along premarginal line).

Structure. Head wide (length/width ratio = 0.92–0.93). Eyes weakly convergent below (UOD/LOD ratio = 1.24–1.25). Clypeus 1/3 below suborbital tangent, apicolateral margins convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2OD below median ocellus. Eye wider than gena. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum relatively elongate (MMR ratio = 1.18), posterior margin carinate, separated from posterior surface. Propodeum with dorsolateral slope delimited below by strong oblique carina forming an obtuse angle, lateral carina not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 4.17–4.72 mm; head length 1.10–1.33 mm; head width 1.18–1.38 mm; forewing length 3.21–3.48 mm.

Colouration. Mandible yellow on apical half. Flagellum with ventral surface reddish brown. Pterostigma pale brownish yellow. Legs brown, except tarsi pale brownish yellow.

Pubescence. Face below eye emargination with scattered tomentum partially obscuring surface, denser on lower paraocular area. Metasomal sterna sparsely pubescent, S3–S4 with small apicolateral tufts (1 OD).

Surface sculpture. Dorsolateral slope coarsely rugose.

Structure. Head wide (length/width ratio = 0.94–0.97). Eyes strongly convergent below (UOD/LOD ratio = 1.55–1.61). Clypeus 2/3 below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets distant (IAD/OAD > 1.7). Frontal line carinate, ending 1.5 OD below median ocellus. Pedicel shorter than F1. F2 length 2.0X F1. F2–F10 moderately elongate (length/width ratio = 1.31–1.64). Metapostnotum elongate (MMR ratio = 1.08–1.11), posterior margin sharply angled onto posterior propodeal surface.

Terminalia. S7 with median lobe narrowly clavate, apex rounded (Fig. 61). S8 with apicomedial margin weakly convex (Fig. 61). Genital capsule as in Fig. 61. Gonobase with ventral rim distinctly separated. Gonostylus small, dorsal setae elongate. Retrorse lobe elongate, attenuated apically.

Range. Georgia, Mississippi north to New Jersey pine barrens (Fig. 56). **USA**: AL, GA, FL, MS, NC, NJ, SC, TX, VA.

Additional material examined. USA: ALABAMA: 1♀ Baldwin Co., Bon Secour N.W. Ref., T9S R2E Sec. 23 SE, 12.x.1991 (G.C. Eickwort); 1♀ Baldwin Co., Bon Secour N.W. Ref., T9S R2E Sec. 25 S, 12.x.1991 (G.C. Eickwort); 1♀ Baldwin Co., Bon Secour N.W. Ref., T9S R2E Sec. 25 N, 13.x.1991 (G.C. Eickwort); 1♂ Baldwin Co., Bon Secour N.W. Ref., T9S R2E Sec. 25 N, 12–16.x.1991 (T. Schiefer & G.C. Eickwort); [CUIC]; GEORGIA: 1♀ Jasper Co., Oconee N.F., Starr Rd., 18.vii.2008 (J. Hanula & S. Horn); 1♀ Jasper Co., Oconee N.F., Julliett Rd/Powerline, 18.vii.2008 (J. Hanula & S. Horn); 10♀♀ Liberty Co., St. Catherine's Isl., N31°41′ W081°9′. 30.iv–4.v.1995 (A. Sharkov); [PCYU]; FLORIDA: 11♀ Leon Co., Apalachicola National Forest, "ant heaven", N30.31687 W084.50008, 20–27.vi.2005 (Ronquist Lab); 1♀ Putnam Co., Ordway-Swisher Biological Station (UF), Rd. G-11, 14.x.2009 (J.S. Ascher, H.G. Hall); [AMNH]; 1♀ Alachua Co., 28.ii.1930 (C.J. Guard); [CUIC]; 1♀ *paratype*, Inverness, (C. Robertson); [INHS]; MISSISSIPPI: 1♀ Jackson Co., N30.5297 W088.6942, 4–5.vi.2005 (S.W. Droege); [PCYU]; NORTH CAROLINA: 5♀♀ Moore Co., Southern Pines, N35.17389 W079.3925, 159 m, 22.iii.1918; 1♀ Moore Co., Southern Pines, N35.17389 W079.3925, 159 m, 10.iv.1918; [AMNH]; 1♀ So. Pines, 26.iii.1923 (A.H. Manee); [CNC]; 1♀ Holly Shelter, 16.ix.1952 (T.B. Mitchell); 1♂ Holly Shelter, 9.x.1954 (T.B. Mitchell); 1♀ Raleigh, 11.vii.1949 (M.W. Wing); [CUIC]; SOUTH

CAROLINA: 1♂ C. Sandhills NWR, N34.5597 W080.2561, 6.ix.2006 (S.W. Droege); 1♀ Chesterfield Co., N34.5825 W080.2201, 29.v.2007 (S.W. Droege); 3♀♀ Chesterfield Co., N34.48889 W080.3012, 25.ix.2007 (S.W. Droege); 1♀ Chesterfield Co., N34.5303 W080.3028, 25.ix.2007 (S.W. Droege); 1♂ Chesterfield Co., N34.5306 W080.225, 26.ix.2007 (S.W. Droege); 1♀ Horry Co., N33.6873 W078.8831, 17.viii.2004 (S. Na); 1♀ Williamsburg Co., N33.7103 W079.4425, 17.vii.2007 (D. Green); TEXAS: 1♀ Nacogdoches Co., N31.5011 W094.7839, 9–22.ix.2010 (C. Adams); [CUIC]; VIRGINIA: 1♀ Assateague I., N37.9086 W075.3564, 1–2.vii.2006 (S.W. Droege); 1♀ Assateague I., N37.9181 W075.3274, 30.vi–1.vii.2006 (S.W. Droege); [PCYU].

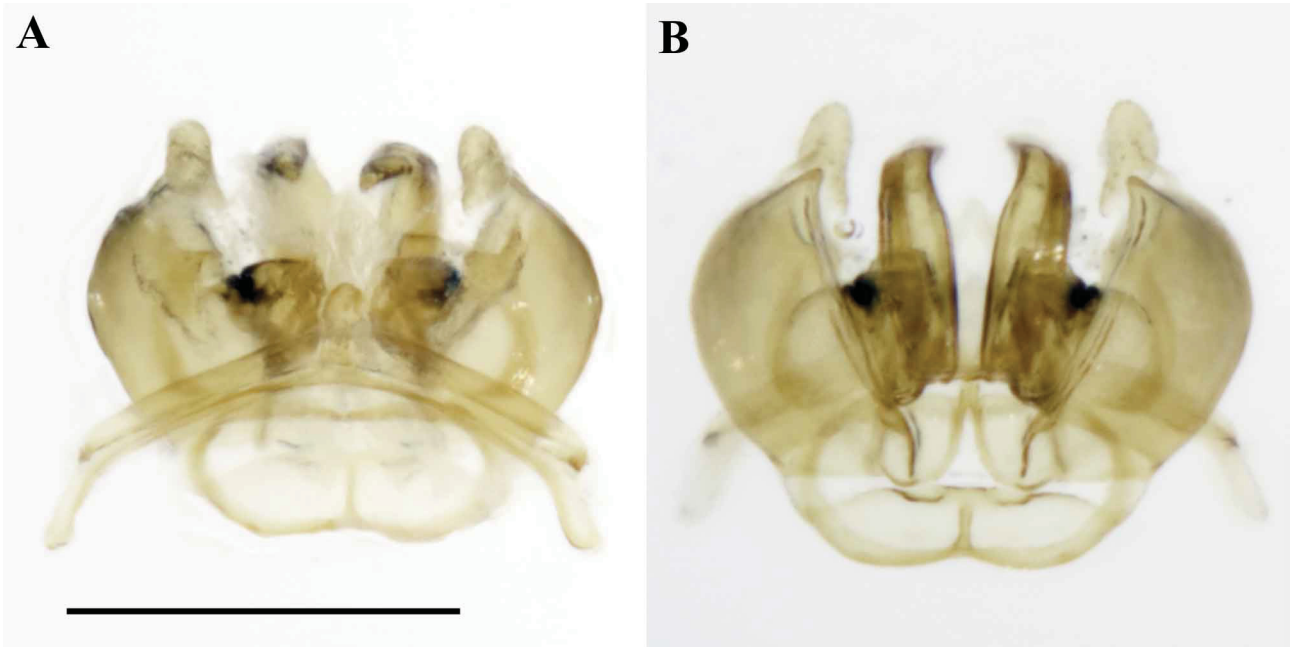

FIGURE 61. *Lasioglossum apopkense* (Mitchell) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

Floral records. AQUIFOLIACEAE: *Ilex*; ASTERACEAE: *Aster*, *Chrysopsis*, *Croptilion*, *Solidago*; CARDIACEAE: *Rhus*; CLUSIACEAE: *Hypericum*; FABACEAE: *Melilotus*; POLYGONACEAE: *Polygonella*; RHAMNACEAE: *Ceanothus*; ROSACEAE: *Amelanchier*, *Prunus*; SALICACEAE: *Salix*; UNCERTAIN: "*Gerardia*".

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Lasioglossum (*Dialictus*) *arantium* Gibbs, new species

(Figure 62–65)

Holotype. ♀ USA, Maryland, Worcester Co., Pocomoke River SF, sand dune off Old Furnace Rd., N38.19495 W075.47567, 22–23.vii.2008 (J. & C. Frye, A. Mirto); [PCYU].

Diagnosis. Female *L. arantium* can be recognised by the following diagnostic combination: metasoma reddish orange (Fig. 62A), clypeus with distal half blackish brown (Fig. 62B), postgena completely lineolate, mesoscutal punctures dense throughout (Fig. 63), mesepisternal punctures distinct, and metapostnotal rugae reaching posterior margin. They are superficially similar to *L. pictum*, which has metasoma yellowish orange and distal portion of postgena polished.

Male *L. arantium* can be recognised by the following diagnostic combination: head round (length/width ratio = 1.00); pronotal ridge broadly rounded; parapsidal line narrow; mesepisternum with distinct, dense punctures (Fig. 64A); tegula ovoid; tarsi brownish yellow; metasomal terga brown with reddish posterior margins; T2–T3 with sparse basolateral tomentum (Fig. 64A); T2 apical impressed area distinctly punctate; and sternal pubescence short (1 OD). They are most similar to *L. miniatulum* which lack tomentum on T2–T3 and have blue mesoscutal integument.

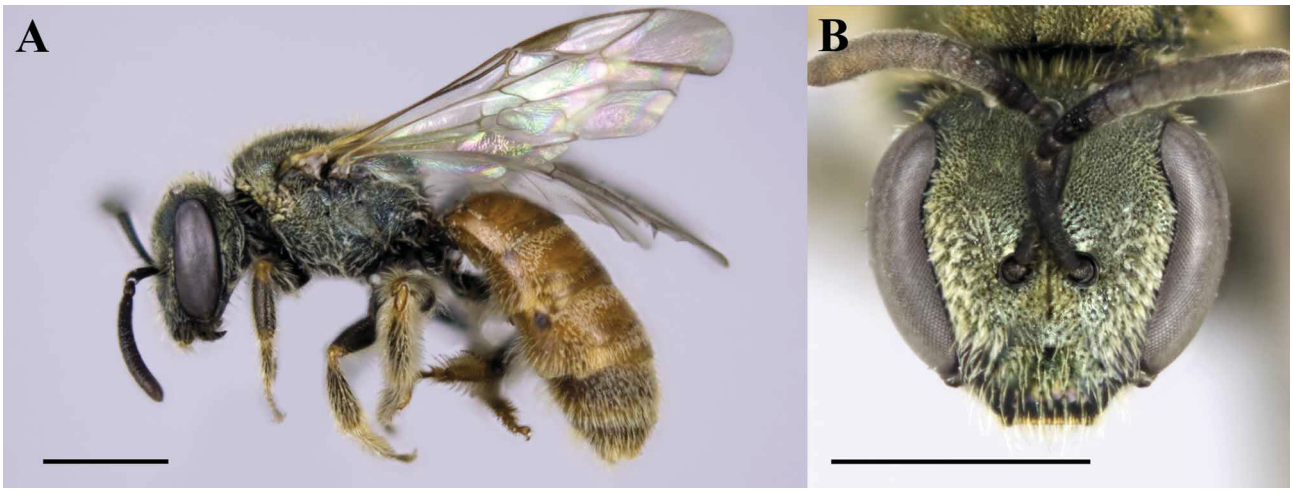

FIGURE 62. *Lasioglossum arantium* Gibbs female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 63. *Lasioglossum arantium* Gibbs female, dorsal view of mesosoma.

Description. FEMALE. Length 4.24–5.14 mm; head length 1.12–1.37 mm; head width 1.12–1.42 mm; forewing length 2.66–3.51 mm.

Colouration. Head and mesosoma pale green with bluish reflections, rarely blue. Labrum reddish brown to yellow. Mandible amber. Clypeus with apical half blackish brown. Antenna dark brown, flagellum with ventral surface reddish brown to yellowish brown. Tegula pale amber. Wing membrane subhyaline, venation and pterostigma yellowish brown. Legs brown, except tibial bases and apices, medio- and distitarsi, and sometimes protibia and basitarsi reddish to brownish yellow. Metasoma terga reddish orange, T4–T5 brown, terga and sterna with apical margins translucent yellow.

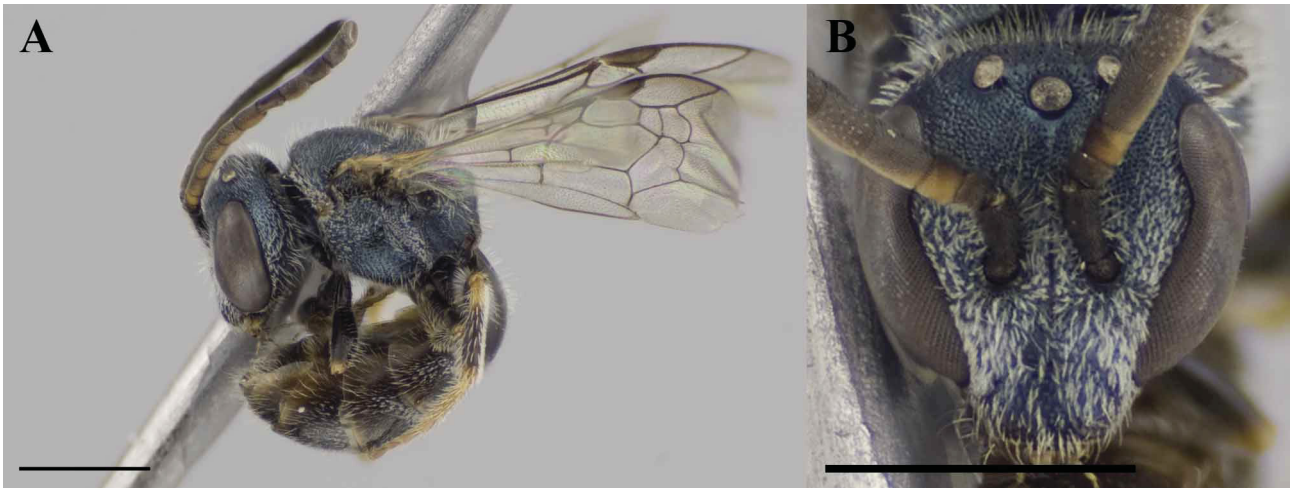

FIGURE 64. *Lasioglossum arantium* Gibbs male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Pubescence. Dull white. Moderately dense. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Lower paraocular area and gena with subappressed tomentum, not obscuring surface. Mesoscutum lateral margins and mesepisternum dorsally with tomentum. Metepisternum obscured by tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately dense, fine hairs. T1 acarinarial fan complete (obscure on pale background). T1 apicolaterally, T2–T3 basally and laterally, and T4 throughout with moderately dense tomentum largely obscuring surface. T2 apicolateral and T3–T4 apical margins with relatively dense fringes.

Surface sculpture. Face imbricate, punctation moderately strong. Clypeus with apical half polished, punctation moderately sparse (i=1–1.5d). Supraclypeal area with punctation moderately sparse (i=1–1.5d). Lower paraocular area and antennocular area punctation dense (i≤d). Upper paraocular area, frons and ocellocular area punctate-reticulate. Gena and postgena lineolate. Mesoscutum weakly imbricate, polished submedially, punctation dense between parapsidal lines (i≤d), contiguous laterad of parapsidal line and punctate-reticulate on anterolateral portion. Mesoscutellum polished, submedial punctation sparse (i=1–3d). Axilla punctate. Metanotum punctate. Preëpisternum rugulose. Hypoepimeral area imbricate-punctate. Mesepisternum rugulose-punctate (i≤d), more polished below. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum with anastomosing rugae nearly reaching posterior margin. Propodeum with dorsolateral slope and lateral surface rugulose-imbricate, posterior surface tessellate. Metasomal terga polished, punctation fine throughout, close on basal halves (i=1–1.5d), more widely spaced on marginal zone (i=1–2d).

Structure. Head wide (length/width ratio = 0.97–1.00). Eyes convergent below (UOD/LOD ratio = 1.17–1.27). Clypeus 1/2 below suborbital tangent, apicolateral margins strongly convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2–2.5 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 2–4 branches. Metapostnotum moderately elongate (MMR ratio = 1.17–1.29), posterior margin rounded onto posterior surface. Propodeum with oblique carina obscure, lateral carina weak, not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 3.88–4.50 mm; head length 1.08–1.23 mm; head width 1.08–1.23 mm; forewing length 3.13–3.19 mm.

Colouration. Mandible yellow on apical half. Flagellum with ventral surface reddish brown, pedicel and F1 brownish yellow ventrally. Pterostigma brown. Base and apex of tibiae brownish yellow. Legs brown, except tarsi pale brownish yellow. Metasomal terga brown, apical impressed areas reddish brown.

Pubescence. Face below eye emargination with scattered tomentum partially obscuring surface, dense on lower paraocular area. T2–T3 with scattered basolateral tomentum. Metasomal sterna sparsely pubescent, S3–S4 with small apicolateral tufts (1 OD).

Surface sculpture. Mesoscutal punctation between parapsidal line relatively sparse (i=1–2d). Mesepisternum distinctly punctate.

Structure. Head wide (length/width ratio = 1.00). Eyes strongly convergent below (UOD/LOD ratio = 1.48–1.59). Clypeus 1/2 below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets distant

(IAD/OAD > 1.4). Frontal line carinate, ending 1.5 OD below median ocellus. Pedicel shorter than F1. F2 length 1.8–2.0X F1. F2–F10 moderately elongate (length/width ratio = 1.60–1.89). Metapostnotum elongate (MMR ratio = 1.00–1.09), posterior margin rounded onto posterior propodeal surface.

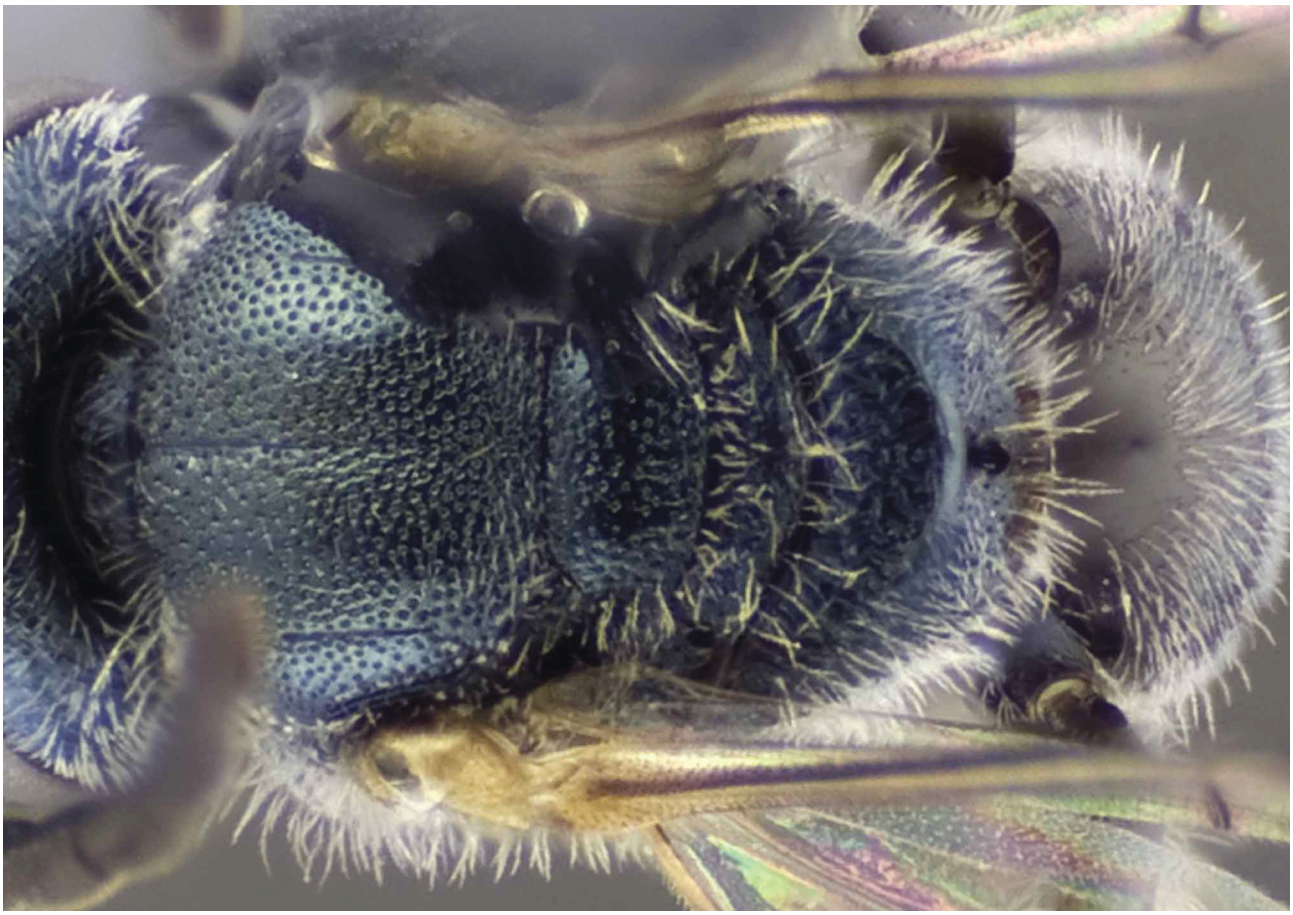

FIGURE 65. *Lasioglossum arantium* Gibbs male, dorsal view of mesosoma.

Terminalia. S7 with median lobe relatively wide, apex truncate. S8 with apicomedial margin weakly convex. Gonobase with ventral rim distinctly separated. Gonostylus small, dorsal setae elongate. Retrorse lobe moderately elongate, rounded apically.

Range. Coastal regions of Maryland and New Jersey (Fig. 66). **USA:** MD, NJ.

Paratypes. USA: MARYLAND: 9 ♀♀ Worcester Co., Pocomoke River SF, sand dune off Old Forest Rd., N38.18584 W075.49646, 22–23.vii.2008 (J. & C. Frye, A. Mirto); 1 ♀ Worcester Co., Pocomoke River SF, sand dune off Old Furnace Rd., N38.19492 W075.47759, 2–3.iv.2008 (J. & C. Frye, A. Mirto); 4 ♀♀ Worcester Co., Pocomoke River SF, sand dune off Old Furnace Rd., N38.19495 W075.47567,, 22–23.vii.2008 (J. & C. Frye, A. Mirto); 2 ♀♀ Worcester Co., Pocomoke River SF, sand dune off Old Furnace Rd., N38.19495 W075.47567,, 5–6.v.2008 (J. & C. Frye, A. Mirto); 10 ♀♀ Worcester Co., Pocomoke River SF, sand dune off Sand Rd., N38.18845 W075.49200, 5–6.v.2008 (J. & C. Frye, A. Mirto); 20 ♀♀ Worcester Co., Pocomoke River SF, sand dune off Sand Rd., N38.18845 W075.49200, 22–23.vii.2008 (J. & C. Frye, A. Mirto); [CUIC, PCYU]; NEW JERSEY: 1♀ Atlantic Co., N39˚37′ W074˚47′, 17.vi.2003 (B. Ahlstrom); 1♀ Atlantic Co., N39˚41′ W074˚46′, 6.vi.2003 (R. Winfree); [PCYU]

Etymology. The specific epithet comes from a Latin word for orange and refers to the colour of the metasoma.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon.

Aside from the strikingly different colour patterns, *L. arantium* is morphologically most similar to *L. miniatulum*. DNA barcodes of these two species are nearly identical. Both species may have preferences for coastal areas. The known ranges of these two species are limited to a relatively small geographic area. Additional sampling in the intervening areas will be important for elucidating the relationship between these two species. Although *L. arantium* may be difficult to distinguish from *L. pictum* using the key, the ranges of the two species do not seem to overlap.

FIGURE 66. Distribution map of *Lasioglossum arantium* (circles) and *L. ascheri* (squares).

Lasioglossum (*Dialictus*) *ascheri* Gibbs, new species

(Figure 67–68)

Holotype. ♀ USA, New York, Westchester Co., Pleasantville, Fellows Garden, 27.vi.2005, on *Oenothera* (E. Fetridge); [AMNH].

Diagnosis. Female *L. ascheri* can be recognised by diagnostic combination of labrum wide, flat, dorsal keel absent; mandible without preapical tooth; gena much wider than eye; mesepisternum punctate; metapostnotum rugoso-carinulate; tibial scopa reduced; and inner metatibial spur with long branches. *Lasioglossum curculum* is most similar but has a distinct preapical tooth on the mandible and has short branches on inner metatibial spur, not much wider than rachis. *Lasioglossum rozeni* are similar but have widely divergent hypostomal carinae, mandible narrower, and mesepisternum impunctate. *Lasioglossum cephalotes* and *L. lionotum* have the metapostnotum smooth.

Male unknown.

Description. FEMALE. Length mm 4.88–5.13; head length 1.40–1.45 mm; head width 1.78–1.80 mm; forewing length 3.81–4.13 mm.

FIGURE 67. *Lasioglossum ascheri* Gibbs female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Colouration. Head and mesosoma purplish with blue reflections. Clypeus apical portion blackish brown. Antenna dark brown, flagellum with ventral surface orange-yellow. Tegula reddish brown. Wing membrane subhyaline, venation and pterostigma reddish brown. Legs brown, except tarsi brownish yellow. Metasoma reddish brown, terga and sterna margins translucent reddish to yellowish brown.

Pubescence. Dull white. Sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (1.5–2 OD). Face without appressed hairs. Clypeus distal margin with long bristles (2–3 OD). Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (1.5–2 OD). Mesofemoral and mesotibial combs present but sparse relative to non-parasites. Femoral scopa greatly reduced, only a few long, curved hairs remain. Penicillus reduced relative to non-parasites. Metasomal terga with sparse, fine hairs and no tomentum. T1 acarinarial fan with wide dorsal opening. T2–T3 apicolateral and T4 apical margins with very sparse fringes. Metasomal sterna with sparse posteriorly curved hairs (2–3 OD).

Surface sculpture. Face polished, punctation fine. Clypeus with punctation sparse (i=1–4d). Supraclypeal area punctation fine, sparse (i=1–2.5d). Lower paraocular area punctation dense (i=1–2d). Antennocular area punctation moderately dense (i=1–1.5d). Upper paraocular area and frons reticulate-punctate. Ocellocular area punctate (i=1–1.5d). Gena lineolate. Postgena imbricate. Mesoscutum polished, weakly imbricate medially. Mesoscutal punctation fine moderately sparse between parapsidal lines (i=1–3d), dense laterad of parapsidal line (i=1–1.5d), contiguous on anterolateral portion. Mesoscutellum similar to mesoscutum, submedial punctation sparse (i=3–6d). Axilla punctate. Metanotum weakly imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate. Mesepisternum punctate (i=1=1–2d). Metepisternum with dorsal third carinulate, ventral portion imbricate. Metapostnotum with coarse striae, interstitial areas polished, posterior margin imbricate. Propodeum with lateral surface imbricate with weak oblique striae, posterior surface imbricate-tessellate. Metasomal terga polished, punctation on basal halves moderately sparse (i=2–3d), sparse on apical halves (i=2–4d).

Structure. Head very wide (length/width ratio = 0.78–0.81). Eyes weakly convergent below (UOD/LOD ratio = 1.06–1.10). Labrum enlarged and flattened, apical process without dorsal keel. Mandible large without preapical tooth. Clypeus 1/4 below suborbital tangent, apicolateral margins convergent. Antennal sockets moderately close (IAD/OAD < 0.6). Frontal line carinate, ending 2 OD below median ocellus. IOD subequal to OOD. Gena much wider than eye. Pronotal dorsolateral angle acute. Pronotal ridge carinate. Mesoscutum overlapping pronotum medially. Basitibial plate lower carina present. Inner metatibial spur pectinate with 4 branches. Metapostnotum elongate (MMR ratio = 1.11–1.17), posterior margin rounded onto posterior surface. Propodeum with oblique carina virtually absent, lateral carina weak, not reaching dorsal margin. T5 medial specialized area reduced.

MALE. Unknown.

Range. New York (Fig. 66).

FIGURE 68. *Lasioglossum ascheri* Gibbs female, dorsal view of mesosoma.

Paratype. USA: NEW YORK: 1♀ Suffolk Co., Kalbfleisch Field Research Station, Huntington, 15.viii.1962 (P.H. Arnaud); [AMNH; AMNH_BEE00072844].

Floral records. ONAGRACEAE: *Oenothera*.

Etymology. The specific epithet is named for John S. Ascher in gratitude for providing me with the two specimens for study.

Barcode. Not available.

Comments. Rare. *Lasioglossum ascheri* is only known from two specimens collected 47 years apart. *Lasioglossum ascheri* is presumably a social parasite or cleptoparasite of nest-building *Lasioglossum* (*Dialictus*).

Lasioglossum (*Dialictus*) *atwoodi* Gibbs

Lasioglossum (*Dialictus*) *atwoodi* Gibbs, 2010b: 73. ♀.

Holotype. ♀ CANADA, Ontario, Algonquin P.P., Madawaska Lake, 7–19.vi.2007 (E. Proctor); [PCYU]. Examined.

Diagnosis. Female *L. atwoodi* can be recognised by the following diagnostic combination: head moderately wide (length/width ratio = 0.96–0.98); supraclypeal area wide, sparsely punctate (i=1–4d); mesoscutum tessellate-imbricate, punctation moderately coarse, moderately sparse on between parapsidal lines (i=1–2d); tegula reddish brown; mesepisternum strongly rugose; metapostnotal rugae nearly reaching the posterior margin; T1 acarinarial fan with dorsal opening; metasomal terga brown with the apical halves obscurely punctate; and T4 with scattered tomentum not obscuring surface. They are most similar to *L. viridatum*, which has denser supraclypeal punctures, metapostnotal rugae reaching the posterior margin, and T4 with sparse tomentum partially obscuring surface.

Male unknown.

Range. Nova Scotia west to Wisconsin, south along the Appalachian mountains to North Carolina. **USA**: IL, IN, MA, MD, ME, MI, NC, NH, NJ, NY, PA, WI. **CANADA**: NS, ON.

DNA Barcode. Available. Multiple haplotypes.

Comments. Uncommon.

Lasioglossum (*Dialictus*) *batya* Gibbs, new species

(Figures 69–73)

Holotype. ♀ **USA:** SOUTH CAROLINA: Chesterfield Co., N34.5789 W080.2334, 18.v.2006 (S.W. Droege); [PCYU].

Diagnosis. Female *L. batya* can be recognised by the following diagnostic combination: head elongate (length/width ratio = 1.03–1.07), clypeus and supraclypeal area flat and polished (Fig. 69B), mesoscutal punctation dense (i<d) (Fig. 70), metasomal terga brown with moderately sparse tomentum (Fig. 69A), and apical impressed areas with deep and distinct punctation. They are most similar to *L. raleighense*, which has head shorter (length/width ratio = 1.00–1.03) and supraclypeal area imbricate and dull.

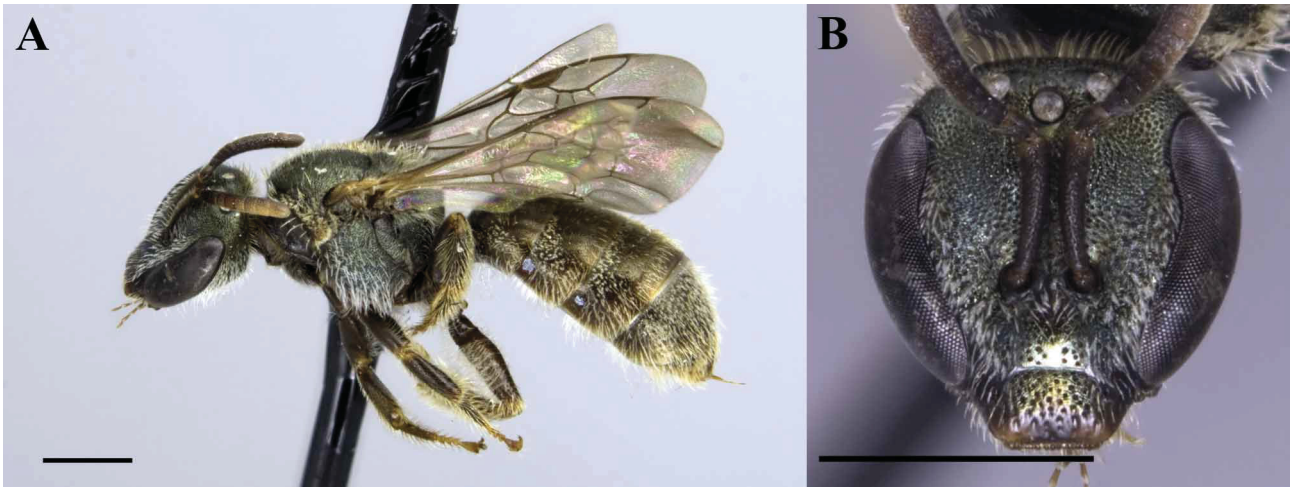

FIGURE 69. *Lasioglossum batya* Gibbs female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Male *L. batya* can be recognised by the following diagnostic combination: clypeus yellow distally (Fig. 70B), supraclypeal area polished, flagellomeres short (F2–F10 length/width ratio = 1.13–1.18), mesoscutal punctures contiguous (Fig. 72), and metasomal terga with apical impressed areas deeply and distinctly punctate. They are most similar to *L. raleighense*, which has the supraclypeal area imbricate and dull.

Description. FEMALE. Length 4.38–4.96 mm; head length 1.44–1.49 mm; head width 1.39–1.42 mm; forewing length 3.12–3.15 mm.

Colouration. Head and mesosoma pale green to bluish green. Clypeus with apical half reddish brown. Supraclypeal area bronze. Antenna dark brown, flagellum with ventral surface reddish brown to orange-yellow. Tegula amber. Wings faintly dusky, venation and pterostigma reddish brown. Legs brown, except medio- and distitarsi reddish brown. Metasomal terga golden brown with narrow reddish rim, sterna brown, apical margins pale, translucent yellow.

Pubescence. Dull white. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena with subappressed tomentum partially obscuring surface. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately dense, fine hairs. T1 acarinarial fan complete. T1 dorsolateral portion with sparse tomentum. T2–T3 laterally and T4 entirely with sparse tomentum not obscuring surface. T2 apicolateral and T3–T4 apical margins with sparse fringes.

Surface sculpture. Face tessellate-imbricate, punctation fine. Clypeus polished, imbricate basally, punctation evenly spaced (i=1–2d). Supraclypeal area polished distally, punctation moderately sparse (i=1–3d). Lower paraocular and antennocular areas with punctation dense (i≤d). Upper paraocular area, frons and ocellocular area punctate-reticulate. Gena and postgena lineolate. Mesoscutum and mesoscutellum tessellate, punctation dense throughout (i≤d). Axilla punc-

tate-reticulate. Metanotum imbricate. Preëpisternum rugose. Hypoepimeral area reticulate-rugulose. Mesepisternum reticulate-rugulose, weakly rugulose posteriorly. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum with weak rugae poorly defined amidst tessellate interstices, posterior margin tessellate-granular. Propodeum with dorsolateral slope tessellate, lateral surface and posterior rugulose-imbricate. Metasomal terga polished, apical impressed areas weakly coriarious, punctation dense and distinct throughout (i=1–1.5d).

FIGURE 70. *Lasioglossum batya* Gibbs female, dorsal view of mesosoma.

FIGURE 71. *Lasioglossum batya* Gibbs male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 72. *Lasioglossum batya* Gibbs male, dorsal view of mesosoma.

Structure. Head elongate (length/width ratio = 1.03–1.07). Eyes strongly convergent below (UOD/LOD ratio = 1.44–1.48). Clypeus ½ below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 4 branches. Metapostnotum truncate (MMR ratio = 1.30–1.42), lateral margin distinct, posterior margin weakly angled onto posterior surface. Propodeum with oblique carina fine, lateral carina not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 4.17 mm; head length 1.39 mm; head width 1.30 mm; forewing length 2.90 mm.

Colouration. Labrum, mandible and distal margin of clypeus brownish yellow. Flagellum with ventral surface brownish yellow. Legs brown, except tibial bases and apices and tarsi brownish yellow.

Pubescence. Paraocular area below eye emargination with tomentum obscuring surface. S2–S4 with moderately elongate woolly hairs (1.5–2 OD).

Surface sculpture. Clypeus and supraclypeal area polished, punctation moderately dense (i=1–1.5d). Mesepisternum reticulate-punctate dorsally. T1 anterior surface with minute punctures closely spaced ventrally (i=1–2d), larger and sparser punctures subdorsally (i=2–4d).

Structure. Head elongate (length/width ratio = 1.07). Eyes strongly convergent below (UOD/LOD ratio = 1.67). Clypeus 2/3 below suborbital tangent, apicolateral margins subparallel. Antennal sockets distant (IAD/OAD = 1.0). Frontal line carinate, ending 2 OD below median ocellus. Pedicel subequal to F1. F2 length 1.0X F1. F2–F10 short (length/width ratio = 0.90–1.18). Metapostnotum moderately truncate (MMR ratio = 1.50), posterior margin rounded onto posterior surface.

Terminalia. S7 with median lobe clavate, apex rounded (Fig. 73). S8 with apicomedial margin weakly convex (Fig. 73). Genital capsule as in Fig. 73. Gonobase with ventral arms narrowly separated. Volsella short, nearly round. Gonostylus small, dorsal setae elongate. Retrorse lobe elongate, attenuated apically.

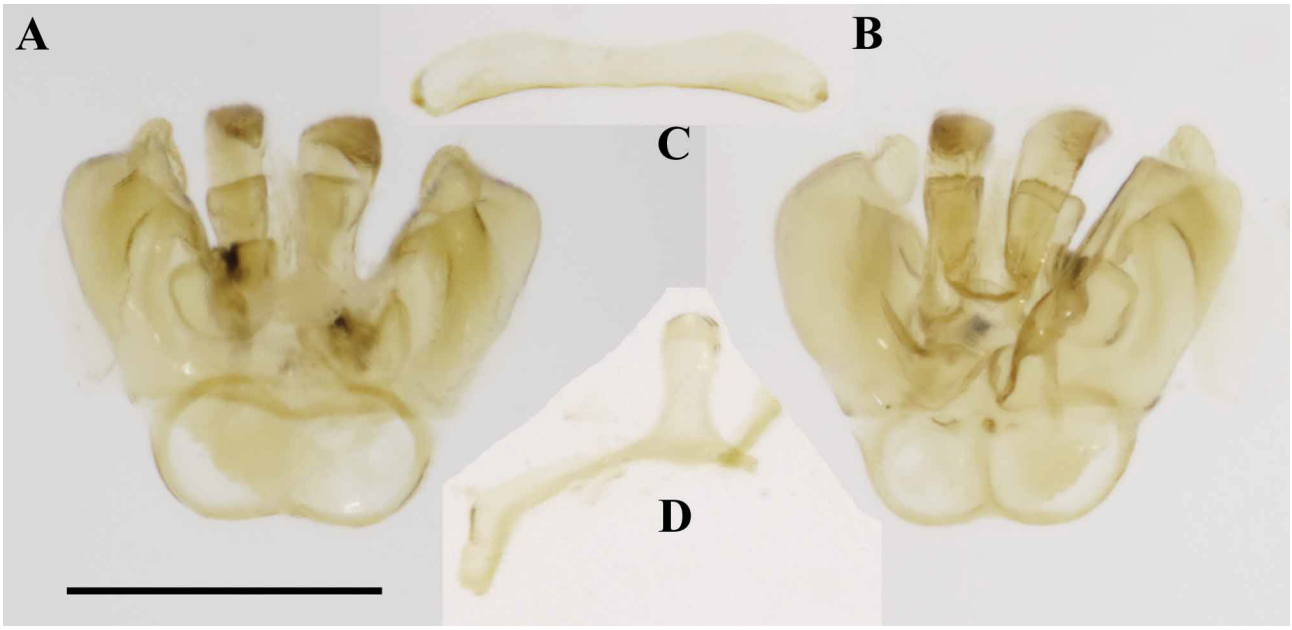

FIGURE 73. *Lasioglossum batya* Gibbs, new species male terminalia, (A) ventral view, (B) dorsal view, (C) S8, (D) S7. Scale bar = 0.5 mm.

Range. South Carolina south to Florida (Fig. 74). **USA**: FL, GA, NC, SC.

Allotype. ♂ **USA:** FLORIDA: Alachua Co., Gainesville, DPI, 18–27.v.1987 (D.B. Wahl); [CNC].

Paratypes. USA: FLORIDA: 2♀♀ Larkins, 14.ix.1921 (S. Graenicher); 1♀ S. Miami, 24.vi.1930 (S. Graenicher); [NCSU]; 1♀ Orange Co., Apopka, Wekima Springs St. Pk., 30.x.1993 (Z. Prusak); 10♀♀ Orange Co., Orlando, 24.v.1996, 10.v.1996, 29.ix.1995, 2.x.1997, 12.x.1995, 30.x.1996, 30.x.1997 (S.M. Fullerton); 1♀ Orange Co., Wekima Sp. St. Pk., 18.xi.2001 (P. Russell, S. Fullerton); 1♂ Orange Co., Wekima Sp. St. Pk., 4.xi.2001 (P. Russell, S. Fullerton); [UCFC]; GEORGIA: 1♀ Thomasville, 12.v.1915 (C.S. Spooner); [CUIC]; 1♀ Zebulon, 12.iv.1938 (P.W. Fattig); 1♀ Zebulon, 19.iv.1938 (P.W. Fattig); [NMNH]; 1♀ Liberty Co., St. Catherine's Isl., N31˚40.9′ W081˚8.8′, 23–28.vi.1996 (A. Sharkov); [PCYU]; NORTH CAROLINA: 1♀ Wayne Co., 23.v.1954 (T.B. Mitchell); [CUIC]; SOUTH CAROLINA: 1♀ Dillon, 25.iv.1923 "F4677A"; [AMNH]; 1♀ Chesterfield Co., N34.5789 W080.2334, 18.v.2006 (S.W. Droege); [PCYU].

Etymology. The specific epithet is named in honour of Barbara Bronfman in recognition of the Bronfman family's generous donations to the David Suzuki Foundation. The name is treated as a noun in apposition and is derived from her Hebrew name meaning 'daughter of god'.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon.

DNA barcodes from two specimens of *L. batya* are identical. Three sequences from the similar species *L. raleighense* have a sequence divergence of more than 2.3% from the *L. batya* sequences. The level of DNA barcode divergence between these two is similar to adjacent clusters of other *L.* (*Dialictus*) (Gibbs 2009a). The morphological characters that separate these two species are small though distinct.

Lasioglossum (*Dialictus*) *bruneri* (Crawford)

Halictus Bruneri Crawford, 1902a: 237. ♀.

Holotype. ♀ USA, Nebraska, West Point, 10.vi.1901 (J.C. Crawford); [NMNH: 8231]. Examined.

Halictus brimleyi Crawford, 1932: 71. ♀.

Holotype. ♀ USA, North Carolina, Bryson City, 24.v.1923 on *Ilex opaca* (J.C. Crawford); [NMNH: 40306]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *bruneri*, p. 1112 (catalogue, synonymy); Mitchell, 1960: *Dialictus bruneri* ♀♂, p. 384 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *bruneri*, p. 462 (catalogue); Hurd,

1979: *Dialictus bruneri*, p. 1964 (catalogue); Moure & Hurd, 1987: *Dialictus bruneri*, p. 92 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *bruneri* ♀♂, p. 76 (redescription, key).

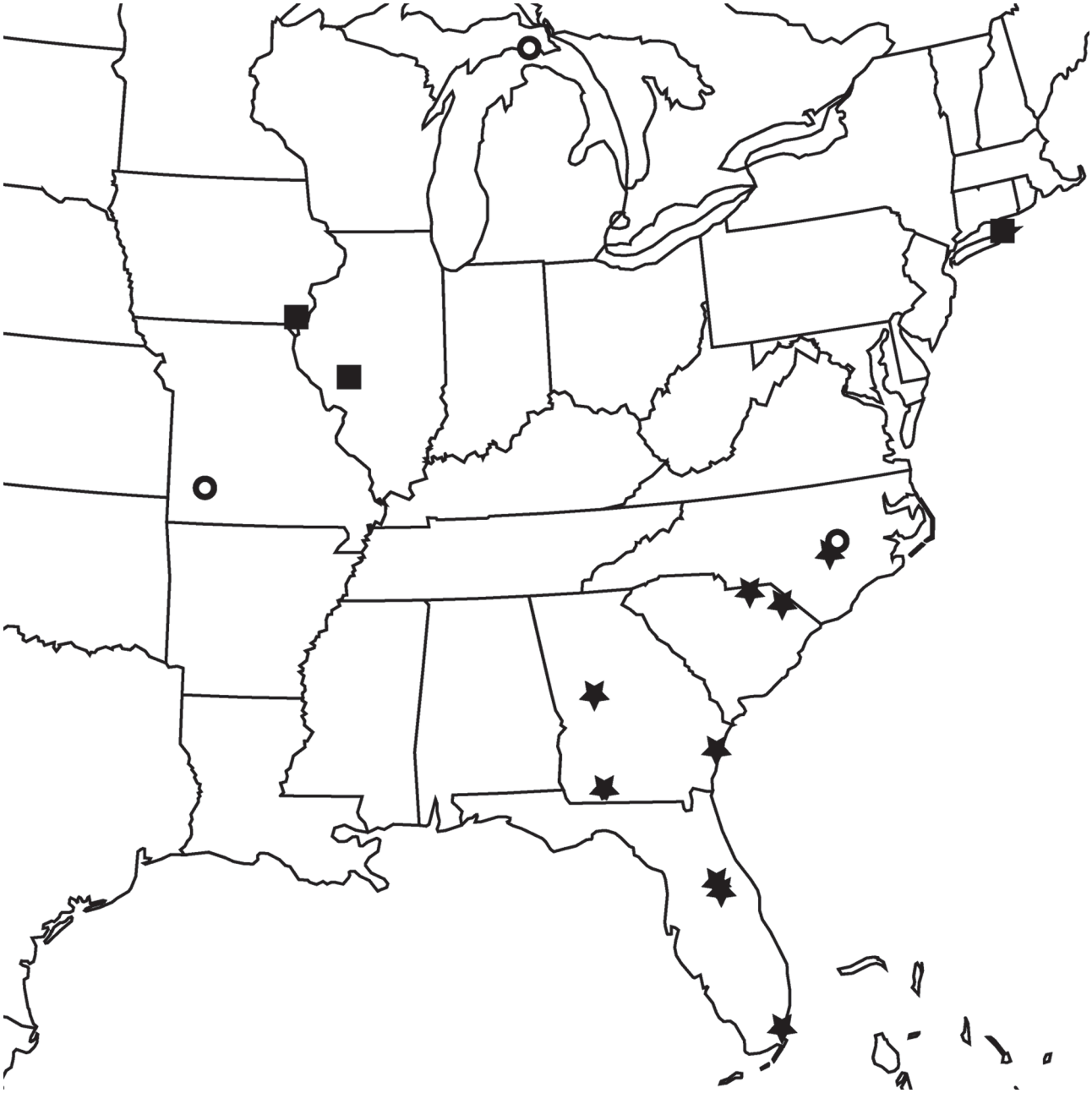

FIGURE 74. Distribution map of *Lasioglossum batya* (stars), *L. ceanothi* (circles) and *L. cephalotes* (squares).

Diagnosis. Female *L. bruneri* can be recognised by the diagnostic character of hypostomal carinae widely divergent (Fig. 11B) and strongly produced distally. They may be further distinguished by the following: size large, head and mesosoma coarsely sculptured, and protrochanter excavated anteriorly. They are very similar to *L. reticulatum*, which has less widely divergent hypostomal carinae, which are not produced distally, and normal trochanters without anterior excavation.

Male *L. bruneri* can be recognised by the following diagnostic combination: mesoscutum rugose anteriorly, mesepisternum coarsely rugose, and tibiae and femora brown. They are most similar to *L. reticulatum*, which has the tibiae and femoral apices and bases reddish brown. Male *L. cressonii* are also similar but have distinct mesoscutal punctures anteriorly and less clypeal pubescence, not obscuring the surface.

Range. Ontario south to Florida, west to Nebraska. **USA**: GA, IL, IN, KS, MA, MD, MI, NC, NE, NM, NY, SC, TN, TX, VA, WI, WV. **CANADA**: ON.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Some females of *L. bruneri*, particularly in the Midwest, do not have strongly produced hypostomal carinae. These have sometimes been mistaken for *L. reticulatum*.

Lasioglossum (*Dialictus*) *callidum* (Sandhouse)

Halictus (*Chloralictus*) *callidus* Sandhouse, 1924: 34. ♂.

Holotype. ♂ USA, Virginia, East Falls Church, 20.vii, on *Daucus carota* (S.A. Rohwer); [NMNH: 26436]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *callidum*, p. 1112 (catalogue); Mitchell, 1960: *Dialictus callidus* ♂, p. 385, *D. versatus* ♀♂ (misdet.), p. 428 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *callidum*, p. 462 (catalogue); Hurd, 1979: *Dialictus callidus*, p. 1965 (catalogue); Moure & Hurd, 1987: *Dialictus callidus*, p. 94 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *callidum* ♀♂, p. 84 (redescription, key).

Diagnosis. Female *L. callidum* can be recognised by the following diagnostic combination: mandible with strongly curved dorsal margin (Fig. 19B), protrochanter wide (Fig. 18B), and mesepisternum rugulose. They share the mandible and protrochanter characters with *L. connexum* (Cresson) but this species has the mesepisternum polished and distinctly punctate. Female *L. callidum* are similar to *L. versatum* and *L. trigeminum*, both of which lack the mandible and protrochanter characters.

Male *L. callidum* can be recognised by the following diagnostic combination: protrochanter wide (Fig. 34B), mesepisternum rugulose, and metasomal terga with distinct punctures on the apical impressed areas. They are similar to *L. connexum* and *L. versatum*. The former species has the mesepisternum punctate and the latter species has the protrochanter narrow.

Range. Ontario south to Georgia, west to Colorado. **USA**: AL, CO, GA, MD, MO, MS, NE, NC, NY, SC, TN, VA, WI. **CANADA**: ON.

DNA Barcode. Available. Multiple sequences. DNA barcodes are identical to those of *L. versatum*.

Comments. Common.

Mitchell (1960) mistook this species in part for *L. versatum* (see Gibbs 2010b).

Lasioglossum (*Dialictus*) *carlinvillense* Gibbs

Lasioglossum (*Dialictus*) *carlinvillense* Gibbs, 2009a: 28. ♀.

Holotype. ♀ USA, Illinois, Macoupin Co., E of Carlinville, N39.2787 W89.7961, 25.vi.2006 (J. Gibbs & C. Sheffield); [PCYU]. Examined.

Diagnosis. Female *L. carlinvillense* are recognisable by the diagnostic combination of tegula enlarged, strongly punctate with distinct posterior angle (Fig. 7A), and inner metatibial spur with 2 branches (not including the apex of the rachis). They are most similar to *L. tegulare*, which has 3 or 4 branches on the inner metatibial spur.

Male unknown.

Range. Illinois.

DNA Barcode. Available. Multiple sequences.

Comments. Rare. *Lasioglossum carlinvillense* has not been commonly collected and may be a primarily Midwestern species (see Gibbs 2009a).

Lasioglossum (*Dialictus*) *cattellae* (Ellis)

Halictus cattellae Ellis, 1913: 209. ♀ ♂.

Holotype. ♀ USA, New York, Garrison, [UCMC]. Examined.

Dialictus alternatus Mitchell, 1960: 433. ♂.

Holotype. ♂ USA, Massachusetts, Forest Hills, 29–30.viii.1922 (W.M. Wheeler); [MCZ: 30469]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *cattellae*, p. 1112 (catalogue); Mitchell, 1960: *Dialictus cattellae* ♀, p. 386 (redescription, key); Krombein, 1967: *Lasioglossum* (*Dialictus*) *alternatum*, p. 462, *L.* (*D.*) *cattellae*, p. 462 (catalogue); Hurd, 1979: *Dialictus alternatus*, p. 1964, *D. cattellae*, p. 1965 (catalogue); Moure & Hurd, 1987: *Dialictus alternatus*, p. 89, *D. cattellae*, p. 94 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *cattellae* ♀♂, p. 89 (redescription, key, synonymy).

Diagnosis. Female *L. cattellae* can be recognised by the following diagnostic combination: head and mesosoma golden green; metasoma vaguely metallic; mesoscutum with yellowish woolly hairs, punctures moderately coarse, sparse medially (i=1–2d); mesepisternal punctures distinct and well spaced (i=1–2d); T1 acarinarial fan without dorsal opening; metasomal terga with sparse punctures basally and nearly impunctate apically, except along premarginal line. They are most similar to *L. tenax*, which is bluish green with finer mesoscutal punctures and dull white woolly hairs on the mesoscutum.

Male *L. cattellae* can be recognised by the following diagnostic combination: mesepisternal punctures deep and distinct, and metasomal terga with punctures dense across disc except apical impressed areas impunctate. They are most similar to *L. perpunctatum*, and *L. tenax*. Male *L. perpunctatum* have apical impressed areas of metasomal terga punctate. Male *L. tenax* have sparse punctures anterior to premarginal line and are usually impunctate on the mesepisternum.

Range. Massachusetts, Michigan south to Georgia, west to Kansas, possibly Ontario and Quebec. **USA**: GA, IL, IN, KS, MA, MD, MI, MO, NC, NY, OH, TN, WV.

DNA Barcode. Available. Multiple sequences. DNA barcodes do not clearly differentiate *L. cattellae* and *L. tenax*.

Comments. Uncommon.

Lasioglossum (*Dialictus*) *ceanothi* (Mitchell)

(Figure 75–76)

Dialictus ceanothi Mitchell, 1960: 386. ♀.

Holotype. ♀ USA, North Carolina, Wayne Co.,15.vi.1955, on *Ceanothus americanus*, (H.V. Weems, Jr.); [FSCA]. Examined.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *ceanothi*, p. 463 (catalogue); Hurd, 1979: *Dialictus ceanothi*, p. 1965 (catalogue); Moure & Hurd, 1987: *Dialictus ceanothi*, p. 94 (catalogue).

Diagnosis. Female *L. ceanothi* can be recognised by the following diagnostic combination: head wide (length/width ratio = 0.90) (Fig. 75B); mesoscutal punctures relatively coarse, moderately dense between parapsidal lines (i=1–1.5d) (Fig. 76); mesepisternum reticulate-rugose; propodeal carinae weak; and T1 polished with acarinarial fan sparse but lacking a dorsal opening. They are similar to *L. foveolatum* and *L. timothyi*. Female *L. foveolatum* have supraclypeal area strongly protuberant lower paraocular area sparsely punctate, and parapsidal lines deep and wide. Female *L. timothyi* have strong propodeal carinae (Fig. 25A) and T1 acarinarial fan dense.

Male unknown.

Description. FEMALE. Length 4.84–5.00 mm; head length 1.40–1.42 mm; head width 1.53–1.57 mm; forewing length 3.75–3.88 mm.

Colouration. Head and mesosoma golden green with some faint bluish reflections. Clypeus with apical half blackish brown, basal half and supraclypeal area bronze. Antenna dark brown, F2–F10 with ventral surface reddish brown. Tegula amber. Wing membrane subhyaline, venation and pterostigma amber. Legs brown, except tarsi reddish brown. Metasoma dark brown, terga and sterna reddish apically.

Pubescence. Dull white. Moderately sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Lower paraocular area and gena with sparse subappressed tomentum not obscuring surface. Metanotum anteromedial margin with tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metepisternum without tomentum. Metasomal terga with moderately dense, fine hairs. T1 acarinarial fan sparse, complete dorsally. T2–T3 basolaterally and T4 entirely with tomentum partially obscuring surface. T2 apicolateral and T3–T4 apical margins with dense apical fringes.

Surface sculpture. Face imbricate, punctation moderately coarse. Clypeus polished, basal margin imbricate, punctation moderately dense (i=1–2d). Supraclypeal area with punctation moderately dense (i=1–1.5d). Lower paraocular area punctation dense (i≤d). Antennocular area punctation moderately dense (i=1–1.5d). Upper paraocular area and frons reticulate-punctate. Ocellocular area distinctly punctate (i≤d). Gena and postgena weakly carinulate. Mesoscutum weakly

imbricate, nearly polished except medially, punctation moderately coarse and dense between parapsidal lines (i=1–1.5d), dense laterad of parapsidal line (i≤d), and anterolateral portion punctate-reticulate. Mesoscutellum polished, submedial

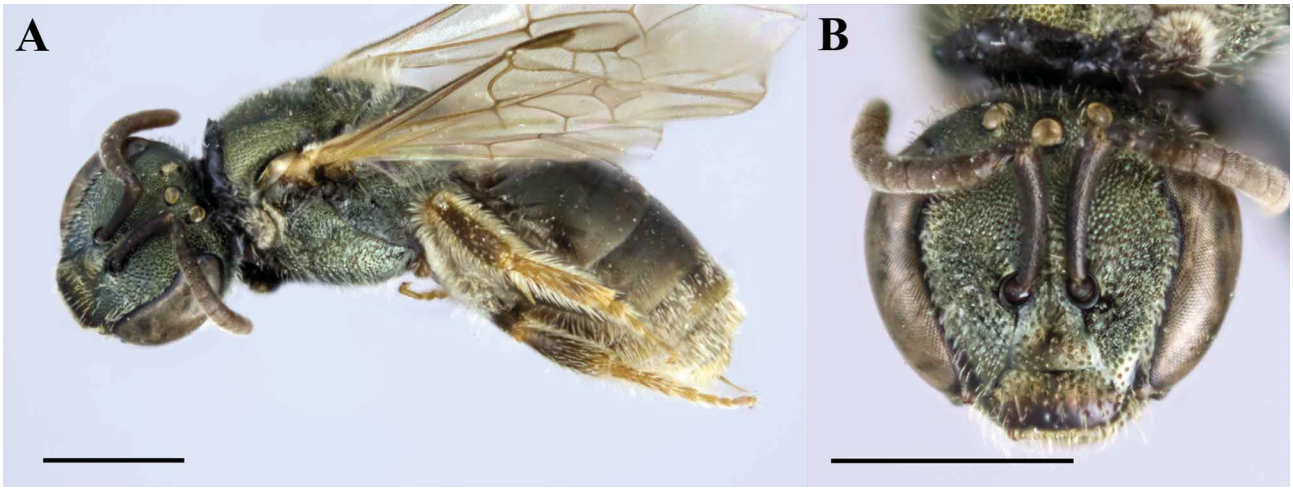

FIGURE 75. *Lasioglossum ceanothi* (Mitchell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

area punctation sparse (i=1.5–2.5d). Axilla punctate. Metanotum ruguloso-imbricate. Preëpisternum rugose. Hypoepimeral area and mesepisternum reticulate-rugose. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum with coarse rugae reaching posterior margin, submedially with anastomosing rugae. Propodeum with dorsolateral slope carinulate anteriorly, rugulose-imbricate posteriorly, lateral surface rugulose-imbricate, posterior surface tessellate. Metasomal terga polished except apical T1 declivitous surface and apical impressed areas weakly coriarious. T1 dorsal surface punctation sparse (i=2–5d). T2–T4 punctation moderately sparse medially (i=1–3d), denser laterally (i=1–1.5d).

Structure. Head very wide (length/width ratio = 0.90–0.92). Eyes convergent below (UOD/LOD ratio = 1.22–1.27). Clypeus 1/2 below suborbital tangent, apicolateral margins convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2 OD below median ocellus. Supraclypeal area distinctly convex. Inner metatibial spur pectinate with 3 branches. Metapostnotum moderately elongate (MMR ratio = 1.13–1.17), narrowly rounded onto posterior surface. Propodeum with oblique carina virtually absent, lateral carina reaching 2/3 distance to dorsal margin.

MALE. Unknown.

Range. North Carolina, north to Michigan, west to Missouri (Fig. 74). **USA**: MI, MO, NC.

Additional material examined. MICHIGAN: 1♀ *paratype* [head glued to label not conspecific] Mackinac Co., 6.vii.1957 (R. & K. Dreisbach); [CUIC]; MISSOURI: 1♀ *paratype* Willard, 11.vi (A.E. Brower); [CUIC]; NORTH CAROLINA: 1♀ *paratype* Wayne Co. 15.vi.1955 (H.V. Weems, Jr.); [CUIC].

Floral records. RHAMNACEAE: *Ceanothus americanus*.

DNA Barcode. Unavailable.

Comments. Rare. Only specimens in the type series have been examined.

Lasioglossum (*Dialictus*) *cephalotes* (Dalla Torre)

(Figures 77–78)

Halictus cephalicus Robertson, 1892: 270. ♀♂. (junior primary homonym of *Halictus cephalicus* Morawitz, 1873)

Lectotype. ♀ USA, Illinois, Macoupin Co., Carlinville, 21.vii.1891, (C. Robertson); [INHS]. by W. E. LaBerge (inWebb 1980). Examined.

Halictus cephalotes Dalla Torre, 1896: 57. (new name for *H. cephalicus* Robertson)

FIGURE 76. *Lasioglossum ceanothi* (Mitchell) female, dorsal view of mesosoma.

Taxonomy. Robertson, 1901: *Paralictus cephalicus*, p. 229 (generic description); Viereck, 1916: *Halictus* (*Paralictus*) *cephalicus*, p. 706 (key); Michener, 1951: *Lasioglossum* (*Paralictus*) *cephalotes*, p. 1119 (catalogue); Mitchell, 1960: *Paralictus cephalotes* ♀♂, p. 447 (redescription, key); Krombein, 1967: *Lasioglossum* (*Paralictus*) *cephalotes*, p. 467 (catalogue); Hurd, 1979: *Paralictus cephalotes*, p. 1974 (catalogue); Moure & Hurd, 1987: *Paralictus cephalotes*, p. 143 (catalogue).

Diagnosis. Female *L. cephalotes* can be recognised by the following diagnostic combination: head massive (head width = 2.02 mm), mandible large nearly reaching opposing mandible base, preapical tooth absent, gena much wider than eye, pronotal ridge carinate, mesepisternum punctate, and metapostnotum smooth with short rugae limited to base. They are similar to *L. lionotum*, *L. rozeni* and *L. platyparium*. Female *L. rozeni* and *L. platyparium* both have the metapostnotum extensively rugose. Female *L. lionotum* are much smaller (head width = 1.13–1.20 mm).

Male *L. cephalotes* can be recognised by the following diagnostic combination: head wide and large (length/width ratio = 0.91; head width 1.54 mm), gena and postgena lineolate, antennal sockets widely separated (IAD/OAD > 1.9), pronotal ridge carinate, and mesepisternum punctate. They are most similar to *L. lionotum* and *L. wheeleri*. Male *L. lionotum* are much smaller (head width 1.15–1.22 mm) and have gena and postgena relatively polished. Male *L. wheeleri* have a less modified head and postgena imbricate.

Redescription. FEMALE. Length 6.05–6.23 mm; head length 1.50–1.68 mm; head width 1.80–2.02 mm; forewing length 4.48–4.60 mm

Colouration. Head and mesosoma very dull metallic bluish green. Antenna dark brown, flagellum with ventral surface reddish brown. Tegula dark amber. Wing membrane faintly dusky, venation and stigma amber. Legs brown, except tibial bases and apices, and medio- and distitarsi amber, basitarsi suffused with amber. Metasoma brown, terga and sterna with apical margins translucent brownish yellow.

Pubescence. Dull white. Sparse throughout. Head and mesosoma with moderately sparse woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Face without appressed hairs. Pronotal collar with dense tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD).

Mesofemoral and mesotibial combs dense but short relative to non-parasitic species. Metafemoral scopa reduced relative to nest-building species, only a few elongate hairs curving above ventral surface. Penicillus greatly reduced, indistinguishable from other hairs. Metasomal terga with moderately sparse, fine hairs but no apparent tomentum. T1 acarinarial fan absent, medial portion of declivitous surface without erect hairs. T3–T4 without evident fringes. Sternal hairs erect, posteriorly directed (2–3 OD).

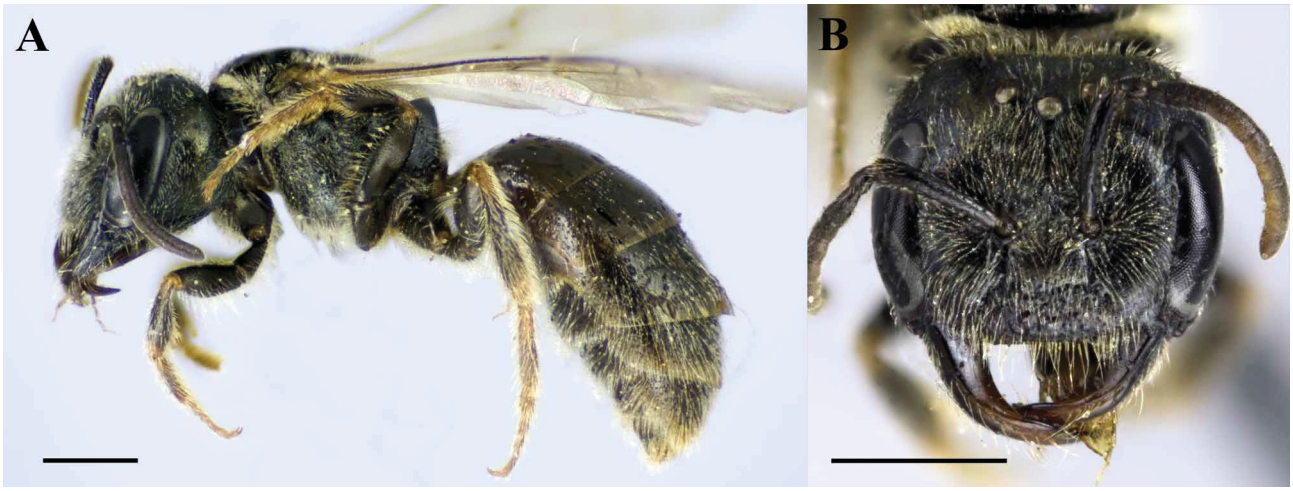

FIGURE 77. *Lasioglossum cephalotes* (Dalla Torre) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

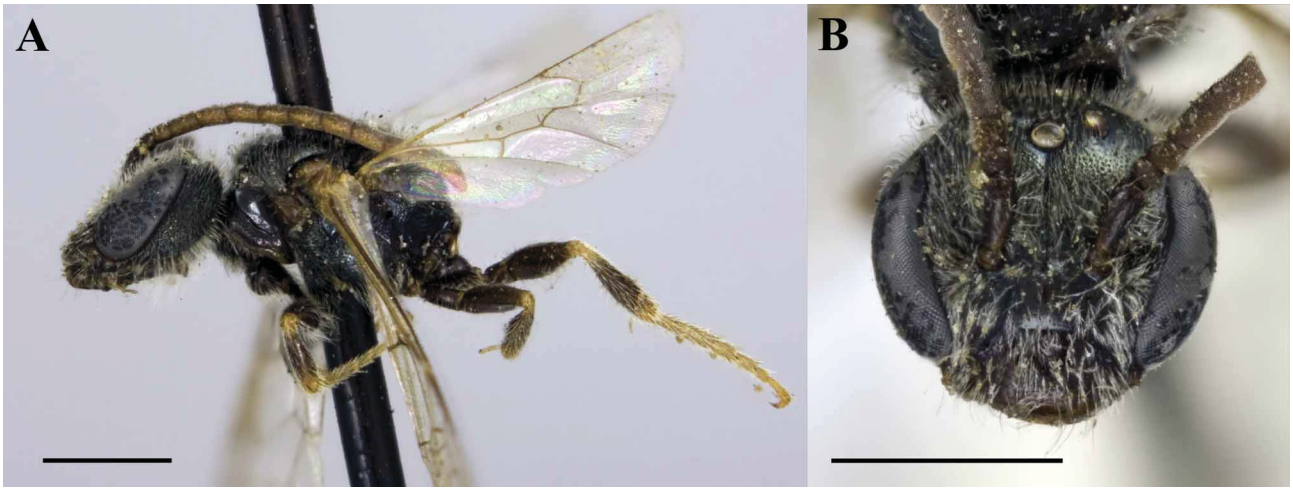

FIGURE 78. *Lasioglossum cephalotes* (Dalla Torre) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Surface sculpture. Face polished, weakly imbricate, punctation fine. Clypeus an supraclypeal area punctation obscured in holotype. Lower paraocular and antennocular areas with punctation moderately sparse (i=1–2d). Upper paraocular area and frons punctation contiguous (i≤d). Ocellocular area punctate (i=1–1.5). Gena polished. Postgena imbricate. Mesoscutum polished, punctation sparse between parapsidal lines (i=1–2d), relatively dense laterad of parapsidal line (i=0.5–1.5d) and dense on anterolateral portion (i≤d). Mesoscutellum similar to mesoscutum. Axilla punctate. Metanotum rugulose-imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate-punctate. Mesepisternum polished, finely punctate (i=1–1.5d). Metepisternum dorsal half rugulose, ventral half imbricate. Metapostnotum with longitudinal rugae not reaching 1/3 distance to posterior margin, posterior surface weakly imbricate. Propodeum with dorsolateral slope weakly imbricate, lateral and posterior surfaces tessellate. Metasomal terga polished except apical impressed areas faintly coriarious, punctation fine (i=1–1.5d), apical impressed areas impunctate.

Structure. Head enormous, very wide (length/width ratio = 0.83). Eyes subparallel (UOD/LOD ratio = 1.00–1.04). Labrum enlarged and flattened without distinct basal tubercle, apical process without dorsal keel. Mandibles large, scythe-like, with minute subapical angle. Clypeus 1/3 below suborbital tangent, apicolateral margins widely convergent. Antennal sockets distant (IAD/OAD > 0.75). Frontal line carinate, ending 2.5 OD below median ocellus. IOD less than

OOD. Gena huge, nearly 1.5 times as wide as eye. Hypostomal carinae divergent towards mandible bases. Pronotal dorsolateral angle acute. Pronotal ridge carinate, weakly interrupted by sulcus. Basitibial plate with posterior carina weak. Inner metatibial spur pectinate with 4 short branches. Metapostnotum truncate (MMR ratio = 1.32), posterior margin rounded onto posterior surface. Propodeum with oblique carina fine, lateral carina short, not reaching dorsal margin. T5 medial specialized area reduced in size relative to non-parasitic species.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 4.38 mm; head length 1.39 mm; head width 1.54 mm; forewing length 3.87 mm.

Colouration. Head and mesosoma dull green with bluish reflections. Flagellum with ventral surface brownish orange. Tegula orange. Wing venation and pterostigma yellowish brown. Legs brown, tibial base and tarsi yellow.

Pubescence. Face with subappressed tomentum obscuring lower paraocular area and partially obscuring clypeus. S3–S4 with apicolateral tufts.

Surface sculpture. Clypeus and supraclypeal area with sparse punctation (i=1–2d). Frons with dense but distinct punctation (i≤d). Gena and postgena lineolate. Hypoepimeral area and mesepisternum polished, distinctly punctate. Metapostnotum with coarse rugae nearly reaching posterior margin. Propodeum with dorsolateral slope rugose.

Structure. Head wide (length/width ratio = 0.91). Eyes strongly convergent below (UOD/LOD ratio = 1.33). Clypeus 1/2 below suborbital line, apicolateral margins convergent. Antennal sockets very distant (IAD/OAD > 1.9). Frontal line carinate, ending 2 OD below median ocellus. Hypostomal carinae only slightly divergent towards mandibles. Pedicel subequal to F1. F2 length 2.0X F1. F2–F10 moderately elongate (length/width ratio = 1.53–1.67). Metapostnotum truncate (MMR ratio = 1.55), posterior margin rounded onto posterior surface.

Terminalia. Not examined.

Range. New York west to Iowa (Fig. 74). **USA**: IA, IL, NY.

Additional specimens examined. USA: ILLINOIS: 1♂ *paratype*, Carlinville, (C. Robertson); [INHS]; IOWA: 1♂ Sioux City, 21.ix.1923 (C.N. Ainslie); [2 submarginal cells in left wing, metasoma missing]; 1♀ Sioux City, 21.ix.1923 (C.N. Ainslie) [head missing]; 1♀ Sioux City, clay bank, ?20.ix.1918? (C.N. Ainslie), [stylopized, pinned with male *L. zephyrum*]; [AMNH]; NEW YORK: Suffolk Co., N41.0371 W071.9248, 7.ix.2005 (S.W. Droege); [PCYU].

DNA barcode. Available. Partial sequence.

Comments. Uncommon.

Lasioglossum cephalotes is the type species of *Paralictus*.

Lasioglossum cephalotes has been collected at banks with nesting *L. zephyrum* (Robertson 1901, 1926) and is presumably a social parasite on that species. Krombein (1967) reports *L. imitatum* (as *L. inconspicuum*) as a host of *L cephalotes* but this was likely a misidentification of *L. lionotum*. Morphological and molecular comparison show close affinities to *L. lionotum* (Gibbs et al. in press.). *Lasioglossum lionotum* is a social parasite of *L. imitatum* and closely related to both *L. imitatum* and *L. zephyrum* (Danforth et al. 2003; Gibbs et al. in press.).

The range of *L. zephyrum* greatly exceeds the known range of *L. cephalotes* (see *L. zephyrum* below). Ontario records for *L. cephalotes* reported by MacKay and Knerer (1979) are in fact *L. lionotum*.

Gibbs (2010b) misidentified an undescribed species (*L. rozeni* below) for *L. cephalotes*. The holotype of *L. cephalotes* was recently re-examined and the mistake was realized.

Lasioglossum (Dialictus) coeruleum (Robertson)

Halictus coeruleus Robertson, 1893: 146. ♀ ♂.

Lectotype. ♀ USA, Illinois, Macoupin Co., Carlinville, 10.iv.1889 (C. Robertson); [INHS: 8806] by W. E. LaBerge (in Webb 1980). Examined.

Taxonomy. Robertson, 1902b: *Chloralictus caeruleus*, p. 248 (key); Viereck, 1916: *Halictus* (*Chloralictus*) *caeruleus*, p. 706; Michener, 1951: *Lasioglossum* (*Chloralictus*) *coeruleum*, p. 1113. (catalogue); Mitchell, 1960: *Dialictus coeruleus* ♀♂, p. 387 (redescription, key); Krombein, 1967: *Lasioglossum* (*Dialictus*) *coeruleum*, p. 463 (catalogue); Hurd, 1979: *Dialictus coeruleus*, p. 1965 (catalogue); Moure & Hurd, 1987: *Dialictus coeruleus*, p. 95 (catalogue); Pesenko *et al*. 2000: *Evylaeus coeruleus*, p. 6 (review); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *coeruleum* ♀♂, p. 97 (redescription, key).

Diagnosis. Both sexes of *L. coeruleum* are easily recognisable by their large size (5.3–7.1 mm), body with deep metallic blue colouration (sometimes with green reflections), sparse metasomal pubescence, and mesepisternal punctures fine (sometimes obscure in females).

Range. Ontario south to Georgia, west to Kansas. **USA**: DE, GA, IL, IN, KS, MA, MD, MI, MN, NY, TX, VA, WI, WV. **CANADA**: ON, PQ.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Lasioglossum coeruleum is known to form primitively eusocial colonies in rotten logs (Stockhammer 1967).

Lasioglossum (*Dialictus*) *coreopsis* (Robertson)

(Figures 79–83)

Chloralictus cereopsis Robertson, 1902b: 249. *Lapsus calami.*
Chloralictus coreopsis Robertson, 1902b: 250.

Lectotype. ♀ USA, Illinois, Macoupin Co., Carlinville, 23.vi.1891 (C. Robertson); [INHS: 11345] by W. E. LaBerge (in Webb 1980). Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *coreopsis*, p. 1113 (catalogue); Mitchell, 1960: *Dialictus coreopsis* ♀♂, p. 388 (redescription, key, synonymy); Krombein, 1967: *Lasioglossum* (*Dialictus*) *coreopsis*, p. 463 (catalogue); Moure and Hurd, 1987: *Dialictus coreopsis*, p. 96 (catalogue).

Diagnosis. Both sexes of *L. coreopsis* can be recognised by the following diagnostic combination: head elongate (length/width ratio = 1.09–1.13) (Figs. 79B, 81B) and mesoscutum coarsely tessellate, punctures sparse between parapsidal lines (i=1–2.5d) (Figs. 80, 82). They are most similar to *L. longifrons*, which has a much longer head (length/width ratio = 1.20–1.21) (Fig. 150B).

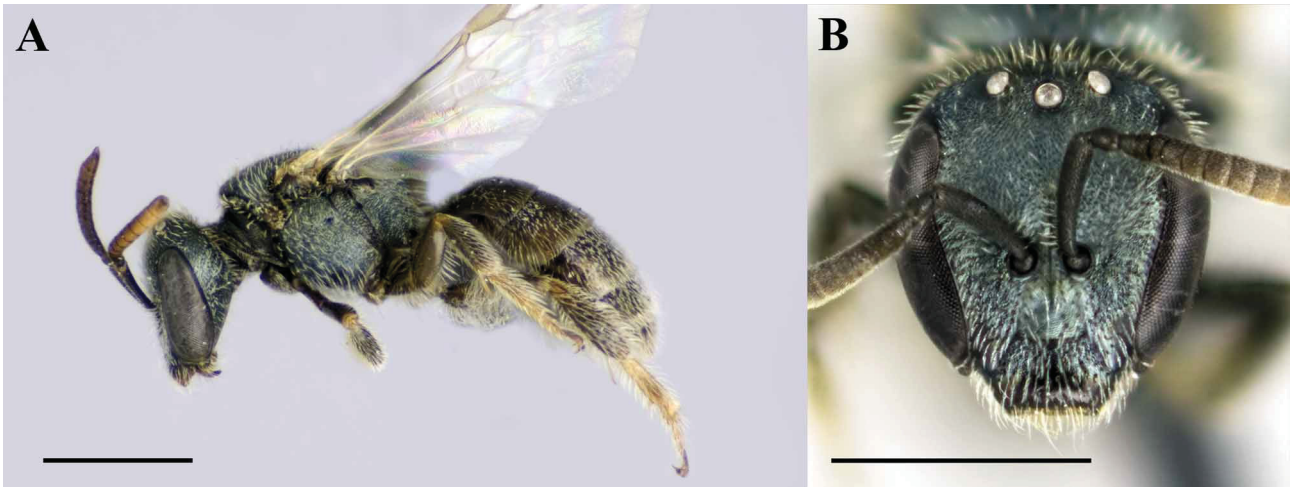

FIGURE 79. *Lasioglossum coreopsis* (Robertson) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Redescription. FEMALE. Length 4.00–4.24 mm; head length 1.20–1.30 mm; head width 1.10–1.20 mm; forewing length 2.72–2.90 mm.

Colouration. Head and mesosoma golden green to bluish green. Clypeus with apical half blackish brown to yellowish brown. Antenna dark brown, flagellum with ventral surface brownish orange. Tegula brownish yellow. Wings subhyaline, venation and pterostigma pale brownish yellow. Legs brown, except medio- and distitarsi reddish brown, metabasitarsus infused with reddish brown. Metasomal terga and sterna golden brown, apical margins pale, translucent yellow.

Pubescence. Dull white. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena with sparse subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately sparse, fine hairs. T1 acarinarial fan dense, complete, without dorsal opening. T2 basolaterally with sparse tomentum. T3–T5 with sparse tomentum not obscuring surface. T2–T4 apical margins with sparse fringes.

Surface sculpture. Face imbricate, punctation fine. Clypeus punctation (i=1–2.5d). Supraclypeal area with punctation moderately dense (i=1–3d). Lower paraocular and antennocular areas with punctation dense (i≤d). Upper paraocular area and frons punctate-reticulate. Ocellocular area obscurely punctate (i≤d). Gena and postgena lineolate. Mesoscutum coarsely tessellate-granulose, punctation sparse on disc (i=1–2.5d), denser laterad of parapsidal line and on anterolateral

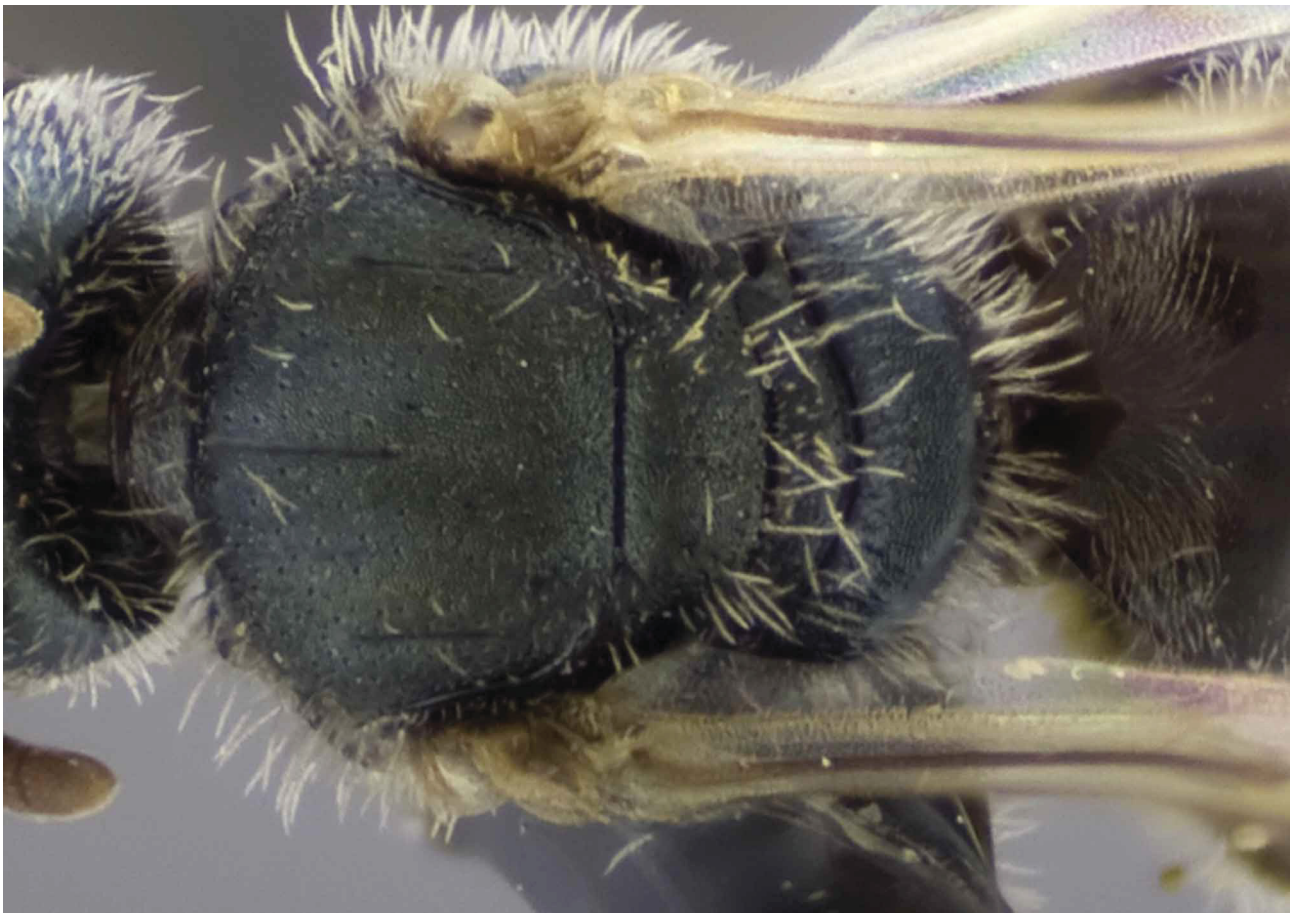

FIGURE 80. *Lasioglossum coreopsis* (Robertson) female, dorsal view of mesosoma.

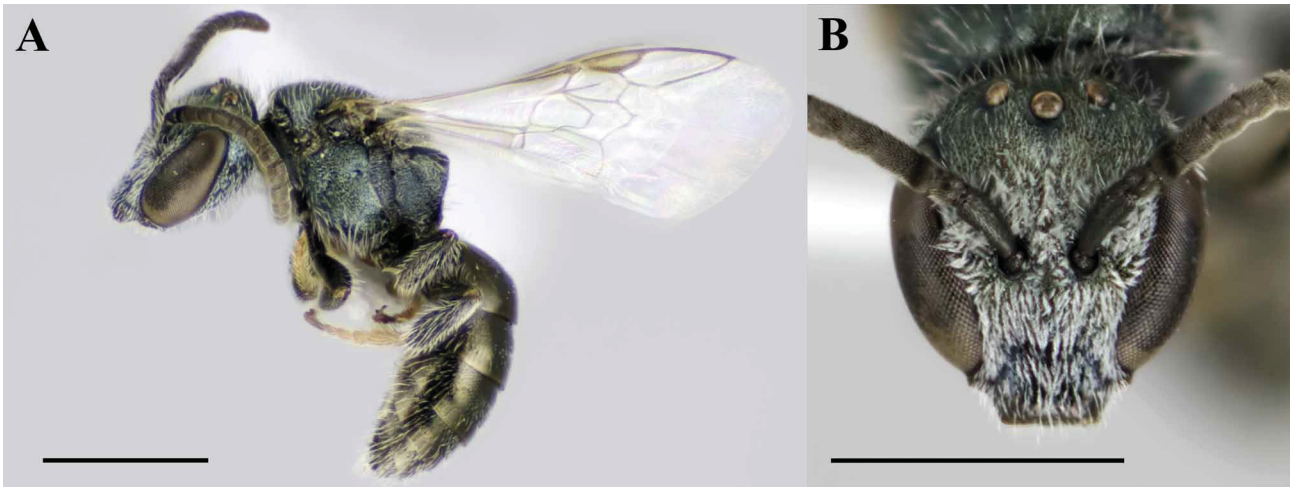

FIGURE 81. *Lasioglossum coreopsis* (Robertson) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

portion (i=1–1.5d). Mesoscutellum tessellate, submedial punctation sparse (i=1–4d). Axilla punctate. Metanotum imbricate. Preëpisternum rugulose-imbricate. Hypoepimeral area tessellate-imbricate. Mesepisternum rugulose-imbricate. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum weakly rugoso-carinulate, posterior margin imbricate. Propodeum with dorsolateral slope imbricate, lateral surface tessellate-imbricate, posterior sur-

face tessellate. Metasomal terga weakly coriarious, punctation moderately dense basally (i=1–1.5d), apical impressed areas obscurely, sparsely punctate.

Structure. Head elongate (length/width ratio = 1.09–1.13). Eyes convergent below (UOD/LOD ratio = 1.38–1.43). Clypeus ½ below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets close (IAD/OAD < 0.5).

FIGURE 82. *Lasioglossum coreopsis* (Robertson) male, dorsal view of mesosoma.

Frontal line carinate, ending 3OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum truncate (MMR ratio = 1.25–1.38), posterior margin rounded onto posterior surface. Propodeum with oblique carina very fine or absent, lateral carina fine, reaching less than halfway to dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 3.75–4.11 mm; head length 1.20–1.22 mm; head width 1.08–1.13 mm; forewing length 2.72–2.84 mm.

Colouration. Legs brown, except tarsi brownish yellow.

Pubescence. Face below eye emargination with tomentum obscuring paraocular area, partially obscuring clypeus and supraclypeal area. Metasomal terga without tomentum. S4–S5 with lateral patches of medially directed hairs (1–1.5 OD).

Surface sculpture.. Metasomal terga punctation moderately dense (i=1–1.5d), apical impressed areas impunctate.

Structure. Head very elongate (length/width ratio = 1.09–1.11). Eyes strongly convergent below (UOD/LOD ratio = 1.58–1.61). Clypeus 1/2 below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets distant (IAD/OAD = 1.0). Frontal line carinate, ending 2.5OD below median ocellus. Pedicel subequal to F1. F2 length 1.4–1.5X F1. F2–F10 moderately elongate (length/width ratio = 1.33–1.50). Metapostnotum normal (MMR ratio = 1.22–1.42), posterior margin weakly angled onto posterior surface.

Terminalia. S7 with median lobe acuminate (Fig. 83). S8 with apicomedial margin weakly convex (Fig. 83). Genital capsule as in Fig. 83. Gonobase with ventral arms narrowly separated. Volsella roughly ovoid. Gonostylus elongate, dorsal setae elongate. Retrorse lobe elongate, attenuated apically.

Range. Florida, north to Maryland, Delaware, west to Kansas, Texas (Fig. 84). **USA**: DE, FL, GA, IL, KS, KY, MD, MO, MS, NC, SC, TN, TX, VA.

Additional specimens examined. USA: DELAWARE: 2♀♀ Fenwick I., N38.6813 W075.0726, 26.viii.2006 (S.W. Droege); [PCYU]; FLORIDA: 1♂ Mount Pleasant, 1.v.1952 (G.S. Walley); [CNC]; 1♀ (*Halictus longiceps* paratype) Inverness (C. Robertson); [INHS]; GEORGIA: 1♂ Ware Co., Deenwood, N31.1319 W082.2307, 42 m, 16–18.vii.1916;

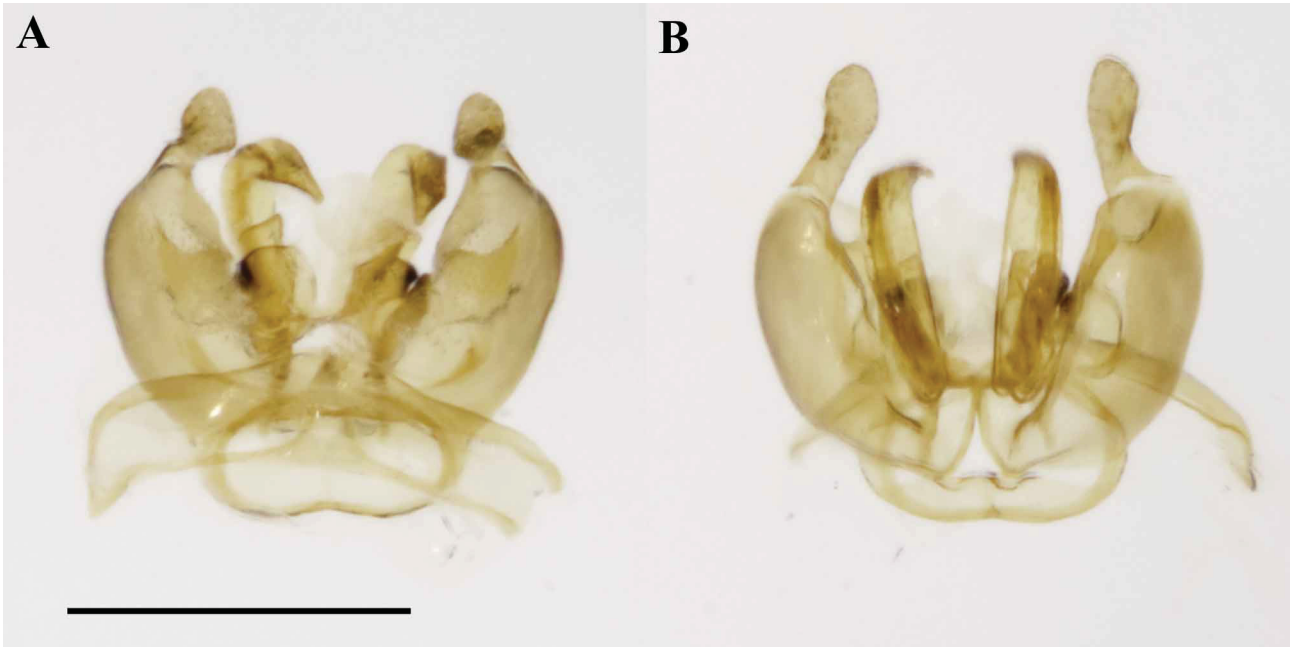

FIGURE 83. *Lasioglossum coreopsis* (Robertson) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

[AMNH]; KANSAS: 1♀ Douglas Co., N39°2.68′ W095°12.24′, 26.viii.2004 (J. Hopwood); [PCYU]; KENTUCKY: 1♀ Wayne Co., N36.924 W084.8715, 23–24.vii.2007 (S.W. Droege); [PCYU]; MARYLAND: 1♀ Montgomery Co., Cabin John, N38.58310 W077.09290,52 m, 27.v.1915 (J.C. Crawford); [AMNH]; 1♀ Caroline Co., N39.1098 W075.7724, 7.iv.2005 (S.W. Droege); [PCYU]; MISSISSIPPI: 3♀♀ Jackson Co., N30.5297 W088.6942, 4–5.vi.2005 (S.W. Droege); [PCYU]; MISSOURI: 1♀ Newton Co., Diamond Grove Prairie, 20.vi.2005 (Arduser); [PCYU]; NORTH CAROLINA: 4♀♀ Swain Co., Andrews Bald Mountain, N35.54166 W083.49333°, 1801 m, 25.vii.1923 (J.C. Crawford); 1♀ Wake Co., Raleigh, N35.77194 W078.63889, 14.vi.1924 (T.B. Mitchell); [AMNH]; 3♀♀1♂ Hoke Co., Fort Bragg Mil. Res., 10–13.vi.1998 (B.N. Danforth); [CUIC]; 1♀ E of Charlotte, N35.24474 W080.53715, 10.viii.2006 (C. Sheffield); [PCYU]; 7♂♂ Horse Cove Bog, nr. Highlands, 2900 ft., 18.vii.1957 (J.G. Chillcott); [CNC]; SOUTH CAROLINA: 6♀♀ Dillon Co., Dillon, N34.41655 W079.37116, 34 m, 25.iv.1923; [AMNH]; 2♀♀ Chesterfield Co., N34.55 W080.26, 2007 (L. Housh); [PCYU]; TEXAS: 2♀♀ Denton Co., N33.2043 N097.0816, 27.iv.2002 (H.W. Ikerd); [PCYU]; VIRGINIA: 1♂ Fluvanna Co., N37.7529 W078.1625, 2.x.2004 (S.W. Droege); [PCYU].

Floral Records. ALISMATACEAE: *Aisma plantago-aquatica*; APIACEAE: *Daucus carota*, *Eryngium*, *Zizia aurea*; AQUIFOLIACEAE: *Ilex*; ASCLEPIADACEAE: *Asclepias*; ASTERACEAE: *Coreopsis palmata*, *C. tripteris*, *Erigeron annuus*, *Haplopappus*, *Helenium*, *Krigia biflora*, *Leucanthemum vulgare*, *Liatris gracilis*, *Mikania scandens*, *Pityopsis graminifolia tracyi*, *Rudbeckia hirta*, *R. subtomentosa*, *Senecio*, *Solidago canadensis*, *Solidago sempervirens mexicana*, *Symphyotrichum novae-angliae*, *S. pilosum*; BRASSICACEAE: *Capsella bursa-pastoris*, *Lepidium virginicum*, *Warea carteri*; CACTACEAE: *Opuntia austrina*; CAPRIFOLIACEAE: *Symphoricarpos orbiculatus*; ERICACEAE: *Rhododendron maximum*; EUPHORBIACEAE: *Croton cascarilla*; FABACEAE: *Amorpha fruticosa*, *Dalea*, *Galactia pinetorum*, *Medicago*; LAMIACEAE; *Piloblephis rigida*, *Pycnanthemum*; ONAGRACEAE: *Oenothera*; PLANTAGINACEAE: *Plantago*; POLEMONIACEAE: *Polemonium reptans*; RANUNCULACEAE: *Ranunculus*; RHAMNACEAE: *Ceanothus*; ROSACEAE: *Fragaria*, *Malus*, *Rubus*, *Spiraea*; RUBIACEAE: *Houstonia purpurea*; SALICACEAE: *Salix*; UNCERTAIN: "*Gerardia*".

DNA Barcode. Available. Multiple sequences.

Comments. Common.

The name *L. coreopsis* is used in a more restricted sense than by some earlier authors due to the resurrection of a previously synonymous name (see *L. longifrons* below).

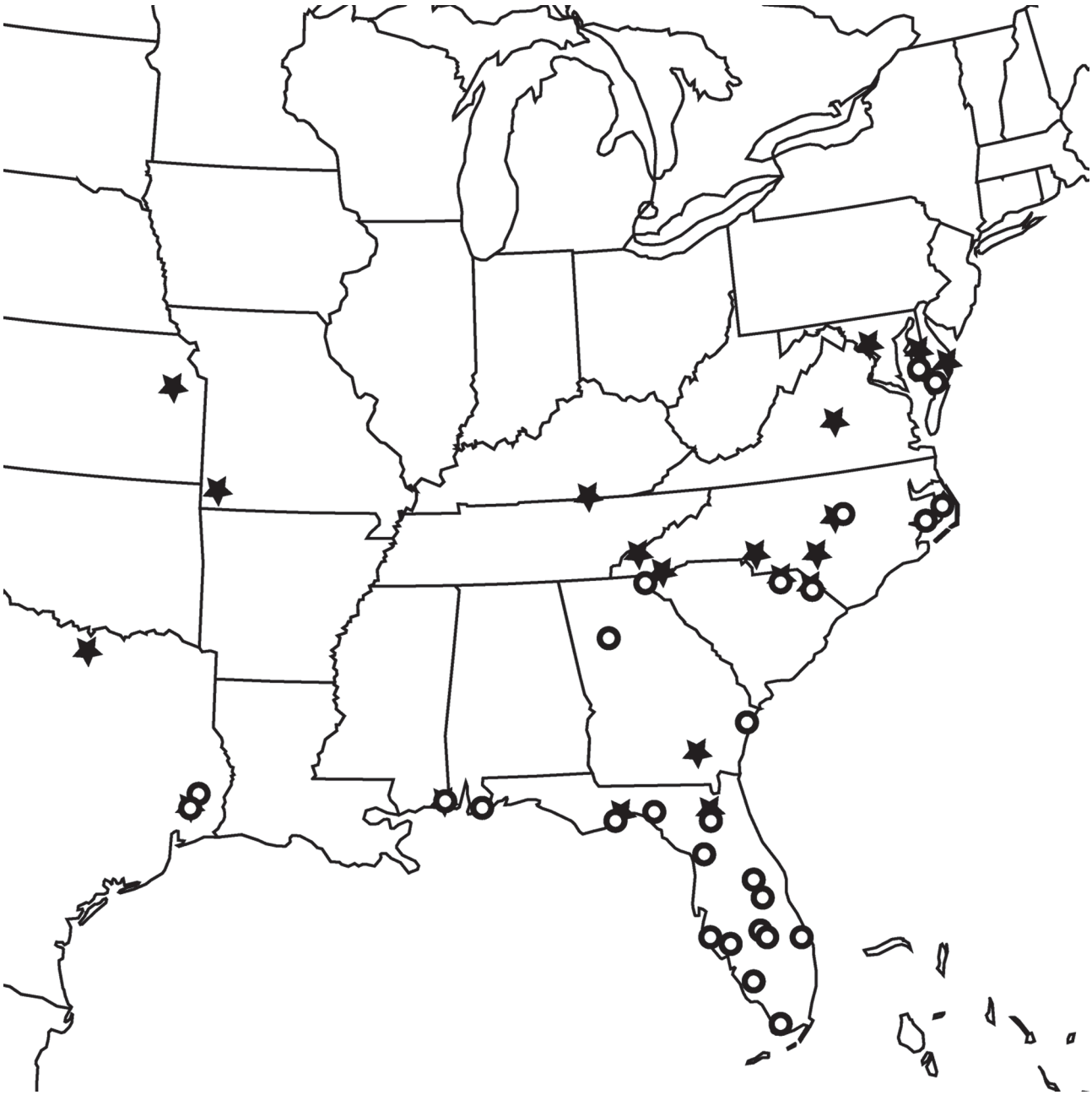

FIGURE 84. Distribution map of *Lasioglossum coreopsis* (stars) and *L. creberrimum*(circles).

***Lasioglossum* (*Dialictus*) *creberrimum* (Smith)**
(Figures 85–89)

Halictus creberrimus Smith, 1853: 72. ♀.
Holotype. ♀ N. America; [BMNH]. Examined.
Halictus ashmeadii Robertson, 1892: 269. ♀.
Lectotype. ♀ USA, Florida, Inverness, 12.ii.1891 (C. Robertson); [INHS: 9989]. Examined.
Halictus ashmeadi Cockerell, 1906: 294 (emend.).

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *ashmeadii*, p. 1112, *L.* (*C.*) *creberrimum*, p. 1113 (catalogue); Mitchell, 1960: *Dialictus creberrimus* ♂♀, p. 389 (redescription, key, synonym); Krombein, 1967: *Lasioglossum* (*Dialictus*) *creberrimum*, p. 463 (catalogue); Moure and Hurd, 1987: *Dialictus creberrimus*, p. 97 (catalogue).

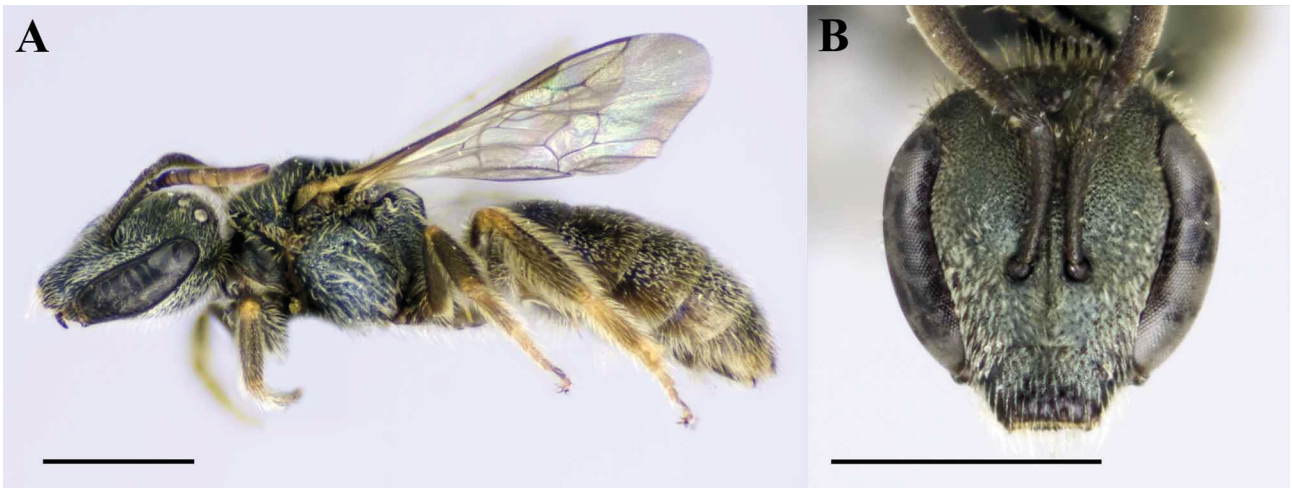

FIGURE 85. *Lasioglossum creberrimum* (Smith) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Diagnosis. Female *L. creberrimum* can be recognised by the following diagnostic combination: head elongate (length/width ratio = 1.05–1.09) (Fig. 85B); mesoscutal punctures dense, except along medial line (Fig. 86); metapostnotal rugae very fine, medially obscure among tessellate background (Fig. 86); T1 acarinarial fan without intermixed erect hairs dorsally; and T2 apical impressed area dull with extremely obscure punctures. They are most similar to *L. halophitum* and *L. tamiamense*. Female *L. halophitum* have mesoscutal punctures sparse medially (i=1–3d), only becoming dense adjacent to the parapsidal lines. Female *L. tamiamense* have T1 acarinarial fan with intermixed erect hairs dorsally and T2 apical impressed area smoother with distinct, but fine punctures.

Male *L. creberrimum* can be recognised by the following diagnostic combination: head elongate (length/width ratio = 1.19) (Fig. 87B); clypeus with distal margin brownish yellow (Fig. 87B); and mesoscutal punctures contiguous, except sparser medially (i=1–1.5d) (Fig. 88); mesoscutellar punctures sparser (i=1–1.5d); T1–T2 at most narrowly impunctate at apical margin; and S5 apical margin weakly concave with sparse apicolateral hairs. They are most similar to male *L. halophitum* and *L. tamiamense*. Male *L. halophitum* have clypeus blackish brown distally and mesoscutum sparsely punctate medially (i=1–3d). Male *L. tamiamense* have mesoscutellar punctures dense (i<d), T1–T2 apical impressed areas impunctate, and S5 apical margin deeply concave with dense apicolateral hairs.

Redescription. FEMALE. Length 3.99–5.45 mm; head length 1.34–1.64 mm; head width 1.27–1.51 mm; forewing length 2.84–3.63 mm.

Colouration. Head and mesosoma pale green to bluish green. Clypeus with apical half blackish brown. Supraclypeal area bronze. Antenna dark brown, flagellum with ventral surface reddish brown. Tegula reddish. Wings faintly dusky, venation and pterostigma yellowish brown. Legs brown, except protibial base and medio- and distitarsi reddish brown. Metasomal terga and sterna brown, apical margins pale, translucent yellow.

Pubescence. Dull white. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena without subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately dense, fine hairs. T1 acarinarial fan complete. T1 apicolateral portion with sparse tomentum. T2–T3 basal and lateral portions, T4–T5 with sparse tomentum obscuring surface. T2–T4 apical margins with moderately sparse fringes.

Surface sculpture. Face tessellate-imbricate, punctation fine. Clypeus punctation (i=1–2.5d). Supraclypeal area with punctation moderately dense (i=1–1.5d). Lower paraocular and antennocular areas with punctation dense (i≤d). Upper paraocular area, frons and ocellocular area punctate-reticulate. Gena and postgena lineolate. Mesoscutum tessellate, punctation dense on medial portion of disc (i=1–1.5d), punctate-reticulate mesad and laterad of parapsidal line and on anterolateral portion. Mesoscutellum weakly imbricate-tessellate, submedial punctation moderately dense (i=1–1.5d). Axilla punctate. Metanotum imbricate. Preëpisternum rugose. Hypoepimeral area rugulose. Mesepisternum rugose, rugulose posteriorly. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum with very weak rugae, posterior margin tessellate-granular. Propodeum with dorsolateral slope carinulate, lateral surface rugulose-tessellate, posterior surface tessellate. Metasomal terga weakly coriarious, punctation moderately dense throughout (i=1–1.5d), very fine and obscure on apical impressed areas.

FIGURE 86. *Lasioglossum creberrimum* (Smith) female, dorsal view of mesosoma.

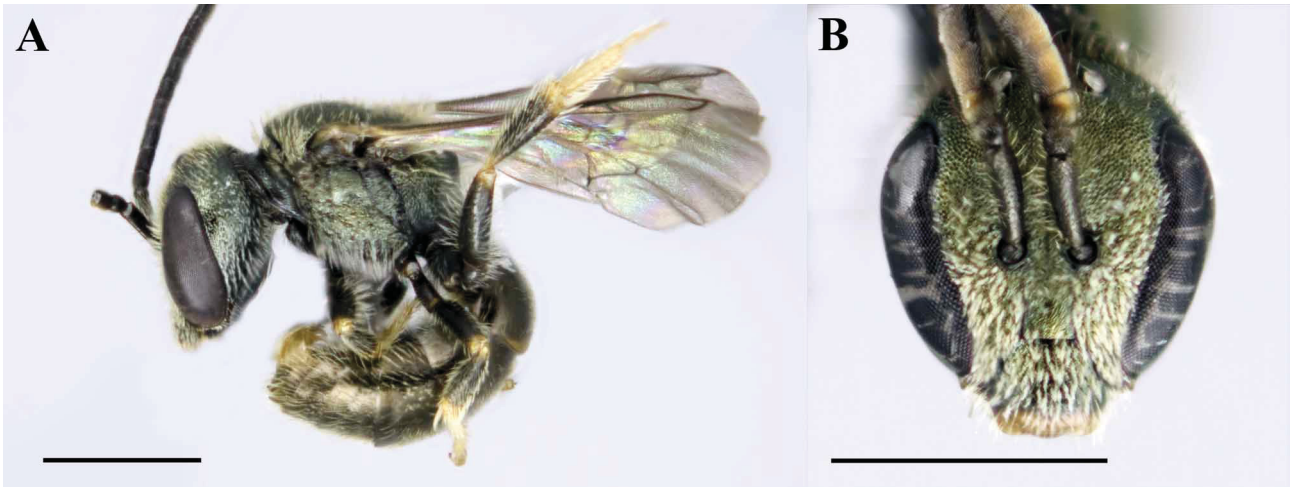

FIGURE 87. *Lasioglossum creberrimum* (Smith) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Structure. Head elongate (length/width ratio = 1.05–1.09). Eyes convergent below (UOD/LOD ratio = 1.21–1.27). Clypeus ½ below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum truncate (MMR ratio = 1.37–1.47), posterior margin weakly angled onto posterior surface. Propodeum with oblique carina fine, lateral carina weak, nearly reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 3.69–4.11 mm; head length 1.37–1.56 mm; head width 1.22–1.28 mm; forewing length 2.66 mm.

Colouration. Labrum, mandible and distal margin of clypeus yellow. Flagellum with ventral surface brownish yellow. Legs brown, except tibial bases and apices and tarsi yellow.

Pubescence. Paraocular area below eye emargination with tomentum obscuring surface. Clypeus with sparse tomentum not obscuring surface. T2–T4 lateral portions with sparse tomentum. S2–S3 apical halves and S4–S5 apicolaterally with sparse posteriorly directed hairs (1–1.5 OD).

FIGURE 88. *Lasioglossum creberrimum* (Smith) male, dorsal view of mesosoma.

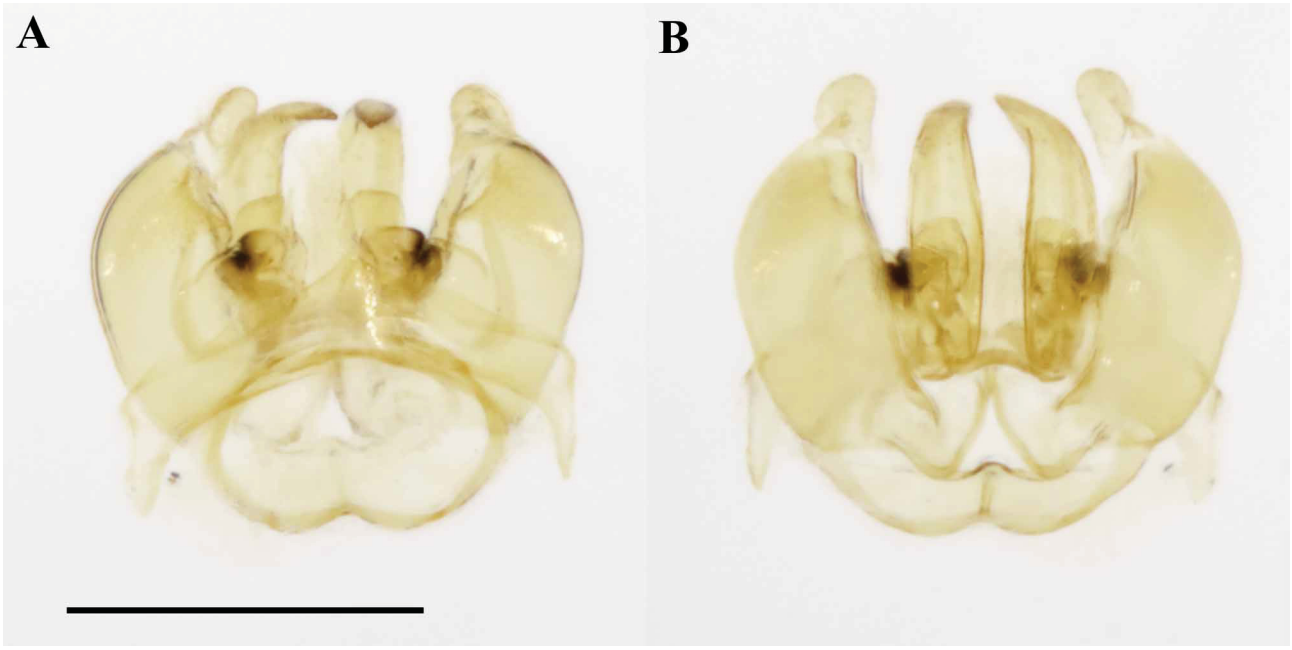

FIGURE 89. *Lasioglossum creberrimum* (Smith) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

Surface sculpture. Mesoscutal punctation sparse on posterior half (i=1–2.5d). Mesoscutellar punctation moderately sparse (i=1–3d). Metasomal terga with apical impressed areas sparsely punctate.

Structure. Head very elongate (length/width ratio = 1.12–1.18). Eyes strongly convergent below (UOD/LOD ratio = 1.33–1.36). Clypeus 2/3 below suborbital tangent, apicolateral margins subparallel. Supraclypeal area longer than wide. Antennal sockets distant (IAD/OAD > 0.6). Frontal line carinate, ending 2.5 OD below median ocellus. Median ocellus above upper orbital tangent. Pedicel shorter than F1. F2 length 1.5X F1. F2–F10 elongate (length/width ratio = 1.60–1.78). Metapostnotum relatively elongate (MMR ratio = 1.15–1.22), posterior margin rounded onto posterior surface.

Terminalia. S7 with median lobe acuminate (Fig. 89). S8 with apicomedial margin weakly convex (Fig. 89). Genital capsule as in Fig. 89. Gonobase with ventral arms widely separated. Volsella roughly ovoid. Gonostylus small, dorsal setae elongate. Retrorse lobe relatively short, strongly attenuated apically.

Range. Maryland south to Florida, west to Texas (Fig. 84). **USA**: FL, GA, LA, MD, MS, NC, SC, TX.

Additional specimens examined. USA: FLORIDA: 1♀ Highlands Co., Archbold Biological Station, N27.18833 W081.33778, 31.iii.2009 (J.S. Ascher, D. Webber), 1♀ Highlands Co., Archbold Biological Station, N27.18833 W081.33778, 31.iii.2009 (J.S. Ascher, H.G. Hall, D. Webber); [AMNH]; 1♀ Everglades N.P., 23.iv.1961 (L.A. Kelton); [CNC]; 1♀ Brighton, 10.iv.1937 (J.C. Bradley); 1♀ Inverness (C. Robertson); 1♀ Punta Gorda, 11.xi.11; 1♂ Alachua Co.; 1♀ Franklin Co., Carrabelle, 23.iii.1981 (L.L. Pechuman); [CUIC]; 6♀♀ (*Halictus ashmeadi* paratypes) Inverness (C. Robertson); [INHS]; 1♀ Collier Co., N26.1676 W081.0757, 27.i.2005 (S.W. Droege); 1♀ Martin Co., N27.0916 W080.1291, 4.vi.2007 (S.W. Droege); [PCYU]; 1♀ Orange Co., Orlando, 4.iii.1992 (S.M. Fullerton); [UCFC]; 1♀ Inverness (C. Robertson); [UCMC]; GEORGIA: 1♀ Rabun Co., Rabun Bald, 4200 ft., 16.vii.1957 (J.G. Chilcott); [CNC]; 1♀ Colquitt Co., Reed Bingham S.P., 23.v.1981 (G.C. Eickwort *et al*.); [CUIC]; 5♀♀ Liberty Co., St. Catherines I., N31˚40.9′ W081˚8.8′m 23–28.vi.1996 (A. Sharkov); [PCYU]; LOUSIANA: 1♀ Sabine River Ferry, 20.vi.1917; [CUIC]; MARYLAND: 1♀ Dorchester Co., N38.432 W076.1589, 21.viii.2003 (S.W. Droege); 1♀ Dorchester Co., N38.4597 W076.1394, 21.viii.2003 (S.W. Droege); 1♀ Somerset Co., N37.9938 W075.7305, 8.v.2002 (S.W. Droege); [PCYU]; MISSISSIPPI: 3♀♀ Jackson Co., N30.3802 W088.7383, 4–5.vi.2005 (S.W. Droege); 1♀ Jackson Co., N30.3992 W088.766, 4–5.vi.2005 (S.W. Droege); [PCYU]; NORTH CAROLINA: 4♀♀ Raleigh, 3.v.1951 (T.B. Mitchell); [NCSU]; 2♀♀ Dare Co., N35.8064 W075.7668, 7.vi.2005 (S.W. Droege); 1♀1♂ Hyde Co., N35.4164 W076.1625, 7.vi.2005 (S.W. Droege); [PCYU]; SOUTH CAROLINA: 6♀♀ Dillon Co., Dillon, N34.41655 W079.37116, 34 m, 25.iv.1923; [AMNH]; 2♀♀ C. Sandhills NWR, N34.6072 W080.2183, 7.ix.2006 (S.W. Droege); [PCYU]; TEXAS: 1♀ Tyler Co., N30.548 W094.409, 19.iv.2008 (J.L. Neff); [CTMI].

Floral records. APIACEAE: *Eryngium*; CLUSIACEAE: *Hypericum*; ERICACEAE: *Kalmia*; ONAGRACEAE: *Oenothera*;; ROSACEAE: *Photinia*, *Rubus*.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Lasioglossum (*Dialictus*) *cressonii* (Robertson)

Halictus Cressonii Robertson, 1890: 317. ♀ ♂.

Lectotype. ♀ USA, Massachusetts [ANSP: 4253] designated herein. Examined.

Dialictus delectatus Mitchell, 1960: 435. ♂.

Holotype. ♂ USA, Maryland, Plummer's Is., 13.ix.1958 (K.V. Krombein); [NMNH: 66072). Examined.

Halictus (*Chloralictus*) *cressoni* Viereck, 1916: 707 (emend.).

Taxonomy. Robertson, 1902b: *Chloralictus Cressonii*, p. 249 (key); Michener, 1951: *Lasioglossum* (*Chloralictus*) *cressonii*, p. 1113 (catalogue); Mitchell, 1960: *Dialictus cressonii* ♀♂, p.390 (redescription, key); Krombein, 1967: *Lasioglossum* (*Dialictus*) *cressonii*, p. 463, *L.* (*D.*) *delectatum*, p. 463 (catalogue); Hurd, 1979: *Dialictus cressonii*, p. 1965, *D. delectatus*, p. 1965 (catalogue); Moure & Hurd, 1987: *Dialictus cressonii*, p. 97, *D. delectatus*, p. 99 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *cressonii* ♀♂, p. 101 (redescription, key, synonymy).

Diagnosis. Female *L. cressonii* are recognisable by the following diagnostic combination: head and mesosoma golden green; hypostomal carinae parallel, unreflexed; mesoscutal punctures very coarse, moderately dense between parapsidal lines (i=1=1.5d) (Fig. 4B); mesepisternum very coarsely rugose; propodeal carinae strong, lateral carina reaching dorsal surface (Fig. 2A); and metapostnotum with posterior margin sharply angled. They are easily distinguished from *L. bruneri* and *L. reticulatum*, which have divergent hypostomal carinae. Female *L. albipenne* have relatively sparse

mesoscutal punctures (i=1–3d) and noticeably pale wings. Female *L. nymphaearum* have hypostomal carinae reflexed distally and metapostnotum with posterior carina uninterrupted.

Male *L. cressonii* are similar to females but may be further recognised by clypeal hairs not obscuring surface, flagellomeres elongate (length/width ratio = 1.69–1.83), and mesoscutum with anterior margin punctate. They are most similar to male *L. bruneri* and *L. reticulatum* which both have anterior margin of mesoscutum rugose and clypeal hairs denser.

Range. Nova Scotia west to British Columbia, Washington, south to Georgia and Colorado. **USA**: CO, CT, GA, IA, ID, IL, IN, KY, MA, MD, ME, MI, MN, MO, NC, NH, NJ, NY, PA, UT, VA, VT, WI, WV. **CANADA**: AB, BC, ON, NB, NS, PE, PQ.

DNA Barcode. Available. Multiple haplotypes.

Comments. Common.

Lasioglossum cressonii is known to nest in rotten wood (Mitchell 1960).

DNA barcodes of *L. cressonii* show levels of genetic divergence suggestive of multiple species (J. Gibbs unpublished data). Morphological examination has not corroborated the existence of additional species. Additional study is required before any new species in this possible complex can be described.

The specimen indicated above is designated herein as the lectotype to ensure stability in the application of the name. A specimen of *L. achilleae* also occurs in the syntype series, which could potentially lead to confusion.

Lasioglossum (*Dialictus*) *curculum* Gibbs, new species

(Figures 90–91)

Holotype. ♀ USA, Maryland, Laurel, 20.v.1965 (W.R.M. Mason); [CNC].

Diagnosis. Female *L. curculum* can be recognised by the following diagnostic combination: labrum wide, flat, dorsal keel absent (Fig. 6B); mandible with distinct preapical tooth; gena much wider than eye; mesepisternum punctate; metapostnotum rugoso-carinulate; tibial scopa reduced; and inner metatibial spur with short branches only slightly longer than width of rachis. *Lasioglossum ascheri* is most similar but lacks a preapical tooth on the mandible and has long branches on the inner metatibial spur, clearly wider than the rachis. They are similar to *L. michiganense*, which has the mesepisternum vertically carinulate.

Male unknown.

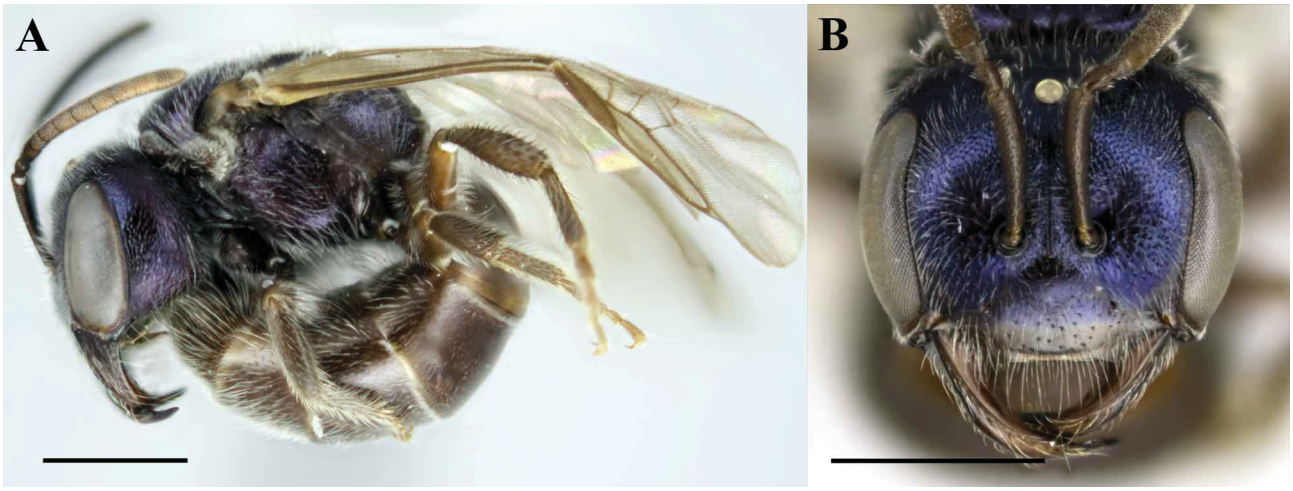

FIGURE 90. *Lasioglossum curculum* Gibbs female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 91. *Lasioglossum curculum* Gibbs female, dorsal view of mesosoma.

Description. FEMALE. Length mm 5.14; head length 1.51 mm; head width 1.82 mm; forewing length 4.05 mm.

Colouration. Head and mesosoma purplish with blue reflections. Clypeus apical portion blackish brown. Antenna dark brown, flagellum with ventral surface orange-yellow. Tegula reddish brown. Wing membrane subhyaline, venation and pterostigma reddish brown. Legs brown, except tarsi brownish yellow. Metasoma reddish brown, terga and sterna margins translucent reddish to yellowish brown.

Pubescence. Dull white. Sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (1.5–2 OD). Face without appressed hairs. Clypeus distal margin with long bristles (2–3 OD). Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (1.5–2 OD). Mesofemoral and mesotibial combs present but sparse relative to non-parasites. Femoral scopa greatly reduced, only a few long, curved hairs remain. Penicillus reduced relative to non-parasites. Metasomal terga with sparse, fine hairs and no tomentum. T1 acarinarial fan with wide dorsal opening. T2–T3 apicolateral and T4 apical margins with very sparse fringes. Metasomal sterna with sparse posteriorly curved hairs (2–3 OD).

Surface sculpture. Face polished, punctation fine. Clypeus with punctation sparse (i=1–4d). Supraclypeal area punctation fine, sparse (i=1–2.5d). Lower paraocular area punctation dense (i=1–2d). Antennocular area punctation moderately dense (i=1–1.5d). Upper paraocular area and frons reticulate-punctate. Ocellocular area punctate (i=1–1.5d). Gena lineolate. Postgena imbricate. Mesoscutum polished, weakly imbricate medially. Mesoscutal punctation fine moderately sparse between parapsidal lines (i=1–3d), dense laterad of parapsidal line (i=1–1.5d), contiguous on anterolateral portion. Mesoscutellum similar to mesoscutum, submedial punctation sparse (i=3–6d). Axilla punctate. Metanotum weakly imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate. Mesepisternum punctate (i=1=1–2d). Metepisternum with dorsal third carinulate, ventral portion imbricate. Metapostnotum with coarse striae, interstitial areas polished, posterior margin imbricate. Propodeum with lateral surface imbricate with weak oblique striae, posterior surface imbricate-tessellate. Metasomal terga polished, punctation on basal halves moderately sparse (i=2–3d), sparse on apical halves (i=2–4d).

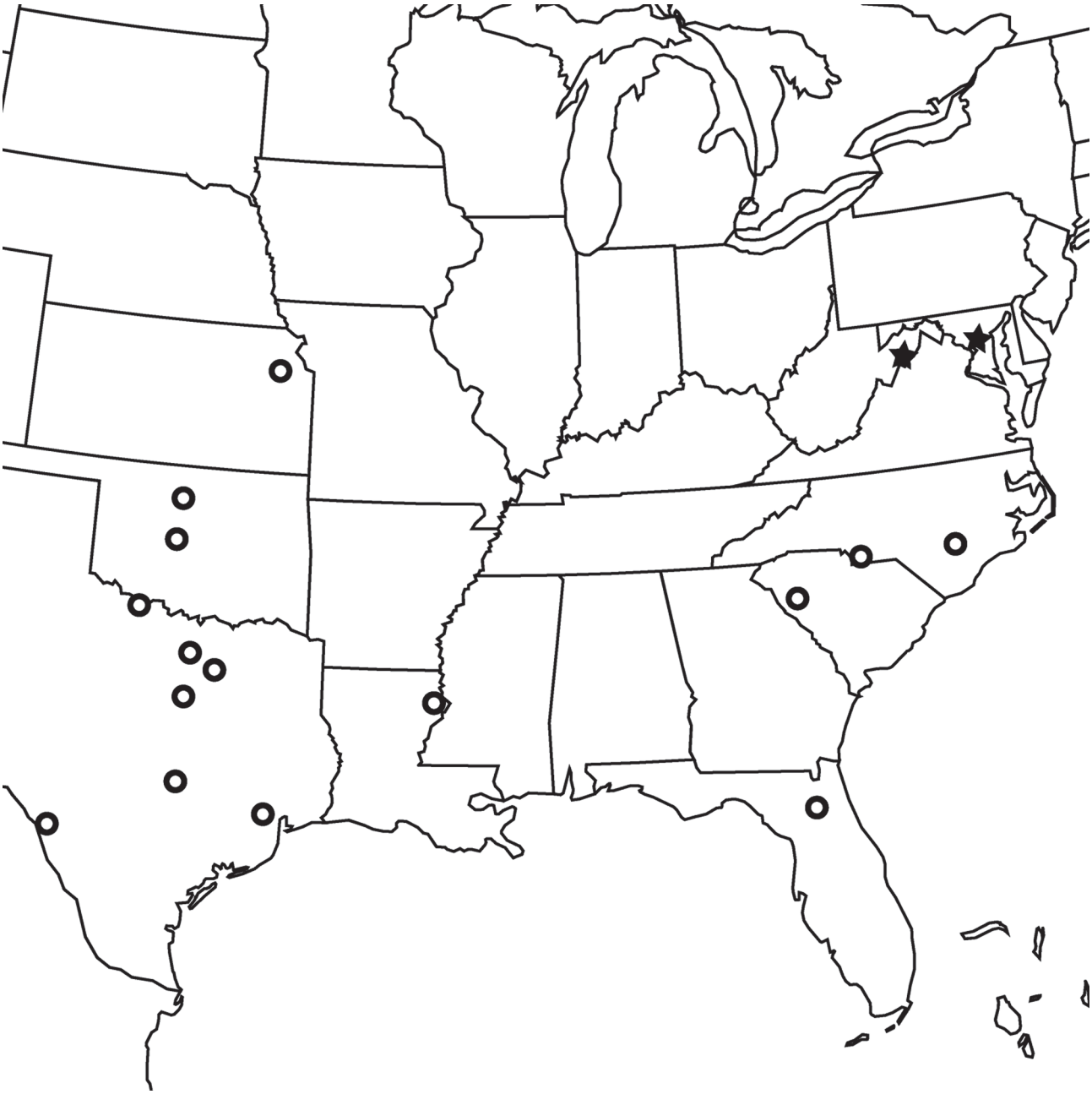

FIGURE 92. Distribution map of *Lasioglossum curculum* (stars) and *L. disparile* (circles).

Structure. Head very wide (length/width ratio = 0.83). Eyes weakly convergent below (UOD/LOD ratio = 1.02). Labrum enlarged and flattened, apical process without dorsal keel. Mandible large with distinct preapical tooth. Clypeus 1/4 below suborbital tangent, apicolateral margins convergent. Antennal sockets moderately close (IAD/OAD < 0.6). Frontal line carinate, ending 2 OD below median ocellus. IOD subequal to OOD. Gena much wider than eye. Pronotal dorsolateral angle acute. Pronotal ridge carinate. Basitibial plate lower carina present. Inner metatibial spur pectinate with 4 branches. Metapostnotum truncate (MMR ratio = 1.32), posterior margin sharply angled onto posterior surface. Propodeum with oblique carina virtually absent, lateral carina weak, not reaching dorsal margin. T5 medial specialized area reduced.

MALE. Unknown.

Range. Maryland and West Virginia (Fig. 92).

Paratype. USA: WEST VIRGINIA: 1♀ Hardy County, 7–27.vi.2007; [CUIC].

Etymology. The specific epithet is derived from the Latin work for "cuckoo".

Barcode. Not available.

Comments. Rare. *Lasioglossum curculum* is only known from two specimens collected 42 years apart. *Lasioglossum curculum* is likely a social parasite or cleptoparasite of nest-building *Lasioglossum* (*Dialictus*).

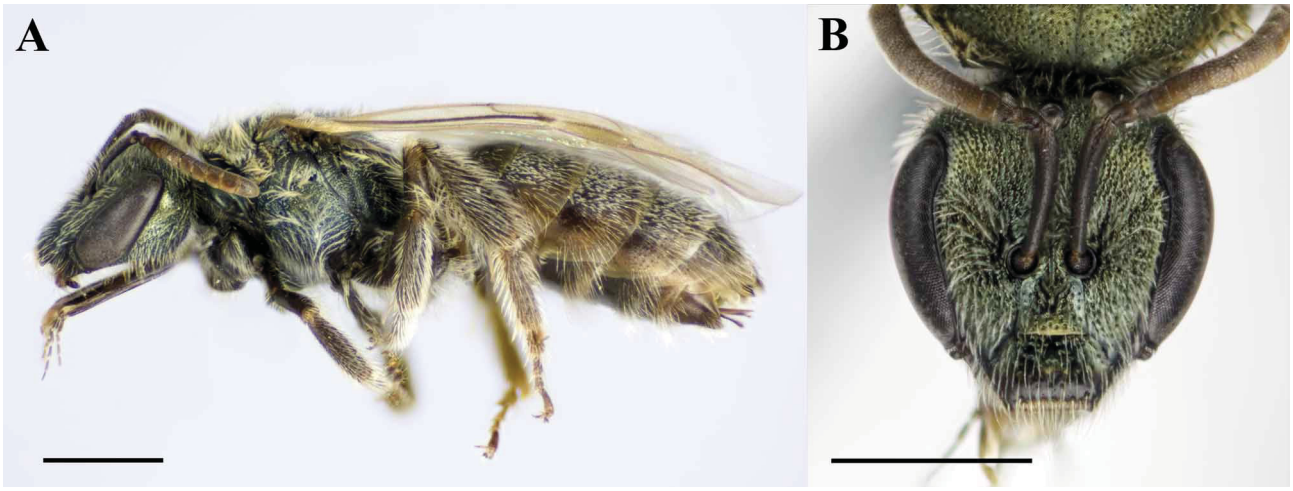

FIGURE 93. *Lasioglossum disparile* (Cresson) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Lasioglossum (*Dialictus*) *disparile* (Cresson)

(Figures 93–97)

Halictus disparilis Cresson, 1872: 253. ♀.

Lectotype. ♀ USA, Texas [Bosque Co.], (G.W. Belfrage); [ANSP: 21204] designated herein. Examined.

Halictus albitarsis Cresson, 1872: 254. ♂. (junior secondary homonym of *Hylaeus abitarsis* Schenck, 1853)

Lectotype. ♂ USA, Texas [Dallas Co.], (J. Boll); [MCZ: 547] designated herein. Examined.

Dialictus brassicae Mitchell, 1960: 384. ♀

Holotype. ♀ USA, North Carolina, Faison, Coastal Plain Vegetable Research Station, 25.iv.1957, on *Brassica* (M.H. Farrier); [NCSU]. Examined.

Halictus albitarsellus Warncke, 1973: 294 (new name for *H. albitarsis* Cresson)

Taxonomy. Cockerell, 1907: *Halictus albitarsis*, p. 38 (tax. notes); Cockerell, 1937: *Halictus* (*Chloralictus*) *disparilis*, p. 113 (diagnosis); Michener, 1951: *Lasioglossum* (*Chloralictus*) *albitarse*, p. 1111, *L.* (*C.*) *disparile*, p. 1113 (catalogue); Krombein, 1967: *Lasioglossum* (*Dialictus*) *brassicae*, p. 462 (catalogue); Hurd, 1979: *Dialictus albitarsis*, p. 1963, *D. brassicae*, p. 1964, *D. disparilis*, p. 1966 (catalogue); Moure & Hurd, 1987: *Dialictus albitarsis*, p. 89, *D. brassicae*, p. 92, *D. disparilis*, p. 99 (catalogue); Gibbs (2010a): *Lasioglossum* (*Dialictus*) *disparile*, p. 92 (tax. notes, synonymy); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *disparile*, p. 109 (tax. notes).

Diagnosis. Female *L. disparile* can be distinguished from all other North American *Dialictus* by the diagnostic hair pattern on the declivitous surface of T1 (Fig. 14A). The acarinarial fan lacks a dorsal opening and is separated from a dorsal transverse band of appressed hairs by a transverse glabrous area. They are similar to *L. albipenne* which lack the dorsal band of appressed hairs (Fig. 14B).

Male *L. disparile* can be recognised by the following diagnostic combination: a strong genal tubercle (Fig. 95A) and distinct mesepisternal punctures. Males also have elongate heads (length/width ratio = 1.08–1.13), clypeus brownish yellow distally (Fig. 95B), tarsi brownish yellow, and T2 apical impressed area impunctate.

Redescription. FEMALE. Length 5.26–6.17 mm; head length 1.61 mm; head width 1.49–1.68 mm; forewing length 3.87–4.42 mm.

Colouration. Head and mesosoma bluish green to golden green. Clypeus with apical half blackish brown. Antenna dark brown, flagellum with ventral surface reddish brown to brownish yellow. Tegula amber. Wing membrane subhyaline, venation and pterostigma brownish yellow. Legs brown, except medio- and distitarsi reddish brown. Metasomal terga brown with faint metallic reflections, apical impressed areas pale brownish yellow.

FIGURE 94. *Lasioglossum disparile* (Cresson) female, dorsal view of mesosoma.

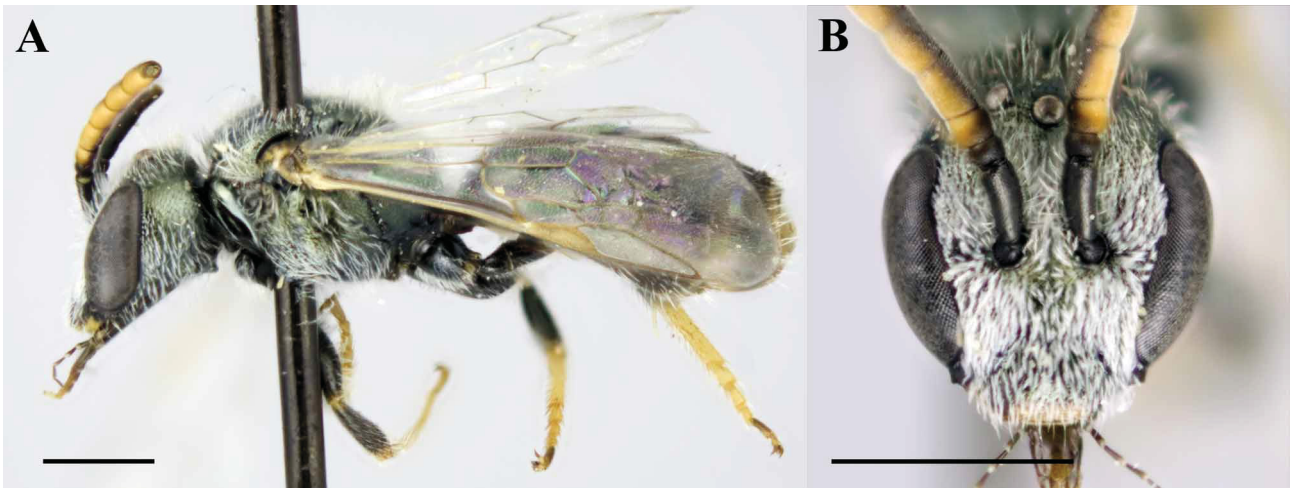

FIGURE 95. *Lasioglossum disparile* (Cresson) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Pubescence. Dull white. Relatively dense. Head and mesosoma with moderately dense woolly hairs (1–2 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena with moderately sparse subappressed tomentum. Propodeum with plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasoma with dense, fine hairs. T1 acarinarial fan large, complete, without dorsal opening, anterior dorsal margin with transverse band of appressed hairs.. T2 basolaterally and T3–T4 partially obscured by appressed tomentum. T2 apicolateral and T3–T4 apical margins with dense apical fringes.

FIGURE 96. *Lasioglossum disparile* (Cresson) male, dorsal view of mesosoma.

Surface sculpture. Face polished, punctation coarse. Clypeus with punctation moderately sparse (i=1–2.5d). Supraclypeal area with punctation moderately sparse (i=1–2d). Lower paraocular area and antennocular area with punctation dense (i=0.5–1.5d). Upper paraocular area and frons reticulate-punctate. Ocellocular area punctate (i≤d). Gena and postgena weakly carinulate. Mesoscutum polished, weakly imbricate medially, punctation coarse, moderately sparse between parapsidal lines (i=1–1.5d), closer laterad of parapsidal line (i≤d), contiguous on anterolateral portion. Mesoscutellum similar to mesoscutum, submedial punctation sparse (i=1–4d). Axilla punctate. Metanotum imbricate. Preëpisternum rugose. Hypoepimeral area ruguloso-imbricate. Mesepisternum rugose anteriorly, rugulose posteriorly. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum coarsely rugoso-carinulate. Propodeum with dorsolateral slope rugulose-imbricate, lateral surface imbricate and posterior surface weakly tessellate. Metasoma polished, very weakly coriarious on apical impressed areas, punctation fine and dense throughout (i=1–2d).

Structure. Head moderately elongate (length/width ratio = 0.99–1.08). Eyes convergent below (UOD/LOD ratio = 1.13–1.21). Clypeus 2/3 below suborbital tangent, apicolateral margins convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2–2.5 OD below median ocellus. Gena width dorsally subequal to eye in lateral view. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum moderately elongate (MMR ratio = 1.22–1.32), posterior margin narrowly rounded onto posterior surface. Propodeum with oblique carina moderately strong, lateral carina moderately strong, reaching 2/3 distance to dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 4.11–4.54 mm; head length 1.31–1.51 mm; head width 1.21–1.34 mm; forewing length 3.03–3.93 mm.

Colouration. Labrum, mandible and distal margin of clypeus yellow. Flagellum with ventral surface orange-yellow. Legs brown, except tibial bases and apices, and tarsi yellow.

Pubescence. Face upper orbital tangent obscured by dense, white appressed tomentum. S2–S3 apical halves and S4 lateral portion with moderately dense subappressed hairs (1.5 OD).

Surface sculpture. Mesoscutal punctures more widely spaced posteriorly i=1–3d). Mesepisternum punctate (i=1–1.5d). Metasomal terga with apical impressed areas impunctate.

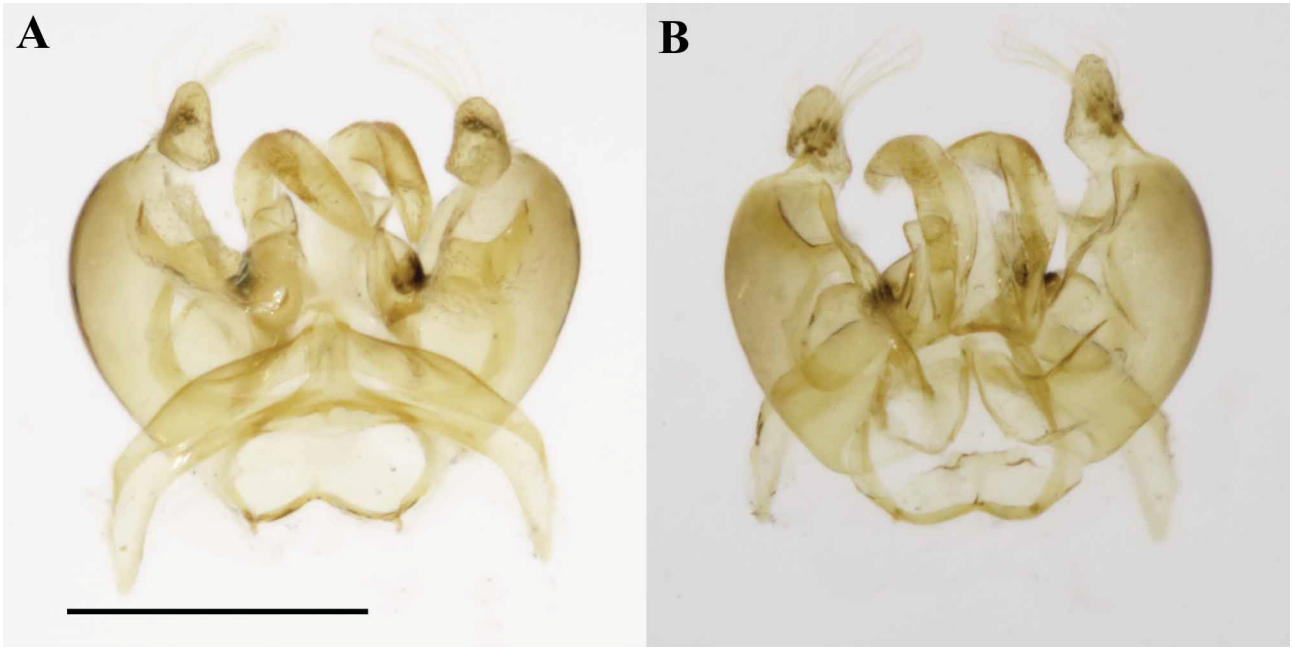

FIGURE 97. *Lasioglossum disparile* (Cresson) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

Structure. Head elongate (length/width ratio = 1.08–1.13). Eyes convergent below (UOD/LOD ratio = 1.29–1.34). Clypeus 2/3–3/4 below suborbital tangent, apicolateral margins convergent. Antennal sockets distant (IAD/OAD > 1.1). Frontal line carinate, ending 2.5 OD below median ocellus. Pedicel longer than F1. F2 length 2.0X F1. F2–F10 elongate (length/width ratio = 1.54–1.75). Gena with distinct tubercle. Metapostnotum moderately truncate (MMR ratio = 1.21–1.35), posterior margin rounded onto posterior surface. Propodeum with oblique carina fine.

Terminalia. S7 with median lobe narrowly clavate, apex rounded (Fig. 97). S8 with apicomedial margin weakly convex (Fig. 97). Genital capsule as in Fig. 97. Gonobase with ventral arms narrowly separated. Volsella roughly ovoid. Gonostylus small, dorsal setae very long, medially oriented. Retrorse lobe elongate, weakly attenuated apically.

Range. Texas north to Kansas, east to North Carolina (Fig. 92). **USA**: FL, IL, KS, LA, NC, NE, OK, SC, TX.

Additional material examined. USA: FLORIDA: 1♀ (*D. brassicae* paratype) Alachua Co., (R.A. Morse); [CUIC]; ILLINOIS: 1♀ Jo Davies Co., Stockton, 18.vii.1968 (J.G. Marlin); 1♀ 10 mi W. San Antonio, 10.iv.1966 (E.R. Jaycox); [INHS]; KANSAS: 1♀ Douglas Co., Akins prairie, N38˚54.361′ W095˚9.351′, 2.viii.2004 (J. Hopwood); 1♀ Douglas Co., Coyler prairie, N38˚49.168′ W095˚21.788′, 9.viii.2004 (J. Hopwood); [PCYU]; LOUSIANA: 2♀♀ Tallulah, iv; [NMNH]; NEBRASKA: 1♀ 2 mi E. of Superior, 8.vii.1959 (W.E. LaBerge & O.W. Isakson); 10♀♀2♂♂ 1 mi. W. Of Hebron, 8vii.1959 (W.E. LaBerge & O.W. Isakson); 6♀♀3♂♂ 5 mi. W. Of Hebron, 8vii.1959 (W.E. LaBerge & O.W. Isakson); [INHS]; NORTH CAROLINA: 1♀ Union Co., N34.984 W080.449, ix–x.2003 (R. Jackowski); [PCYU]; OKLAHOMA: 1♀ Canadian Co., El Reno, N35.5323 W097.955, 14.iv.1961 (J.G. Rozen, R. Schrammel) 1♀ Garfield Co., Enid, N36.39556 W097.878°W, 14.iv.1961 (J.G. Rozen, R. Schrammel); [AMNH]; SOUTH CAROLINA: 2♀♀ 2♂♂ Kirksey, 24.vi.1957 (W.R.M. Mason); [CNC]; TEXAS: 1♂ Maverick Co., Quemado, N28.9478 W100.6236, 236 m, 25.v.1952 (M.A. Cazier, W.J. Gertsch, R. Schrammel); 1♀ Wichita Co., Burkburnett, Red River, N34.0429 W098.3402, 316 m, 26.vi.1948 (C. Vaurie, P. Vaurie); [AMNH]; 2♀♀ Houston, 22.iv.1928 (L. Kestchberg); [CUIC]; 408♀♀ Denton Co., N33.2043 W097.0816, 27.iv.2002 (H.W. Ikerd); 1♂ Bastrop Co., Camp Swift, N30˚16.9′ W097˚18.8′, 2.v.2002 (J.L. Neff); [PCYU].

Floral records. ASTERACEAE: *Engelmannia peristenia*, *Erigeron*, *Helenium*, *Helianthus pauciflorus*, *Hymenopappus artemisiifolius*, *Pyrrhopappus pauciflorus*, *Solidago missouriensis*, *Thelesperma filifolium*; BRASSICACEAE: *Brassica*; HYDROPHYLLACEAE: *Phacelia congesta*; LAMIACEAE: *Stachys floridana*; ONAGRACEAE: *Calylophus serrulatus*.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon east of the Mississippi river. Common in Texas. Doubtful records of *L. disparile* from New Jersey, Ontario, Alberta and Nevada exist (Michener 1951; Moure & Hurd 1987).

The type specimens of *Halictus disparilis* Cresson and *Halictus albitarsis* Cresson have not been formally desig-

nated. The specimen of *Halictus disparilis* indicated above is designated as the lectotype for the purpose of fixing the name to specimen. Some of Cresson's syntype series include more than one species so designation of a single type specimen is warranted. The type series of *Halictus albitarsis* includes males of both *L. disparile* and *L. connexum*. The specimen selected above is designated as the lectotype of *H. albitarsis* to fix the name to a single species. The male of *L. disparile* has paler legs than *L. connexum* so the name seems more aptly associated with the former species.

The smallest male examined lacked a distinct genal tubercle.

For additional taxonomic notes see Gibbs (2010a, 2010b).

Lasioglossum (*Dialictus*) *dreisbachi* (Mitchell)

Dialictus dreisbachi Mitchell, 1960: 391. ♀ ♂.

Holotype. ♀ USA, Michigan, Clare Co., 24.v. 1958 (R. & K. Dreisbach); [NSCU]. Examined.

Taxonomy. *Lasioglossum* (*Dialictus*) *dreisbachi* Krombein, 1967: 463 (catalogue); Hurd, 1979: *Dialictus dreisbachi*, p. 1966 (catalogue); Moure & Hurd, 1987: *Dialictus dreisbachi*, p. 99 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *dreisbachi* ♀♂, p. 110 (redescription, key).

Diagnosis. Both sexes of *L. dreisbachi* can be recognised by the unique mesepisternal sculpture with dorsal half coarsely rugose and sharply delimited from ventral half imbricate with obscure punctation (Fig. 17B). In other respects this species displays characteristics typical of the *L. viridatum* species group (see Gibbs 2010b).

Range. Ontario, west to Alberta, Wisconsin and southeast to Maryland. **USA**: MI, MN, NY, WI. **CANADA**: AB, ON.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon.

Lasioglossum (*Dialictus*) *dubitatum* (Mitchell)

Dialictus dubitalus Mitchell, 1960: 436. ♂. *Lapsus calami* (spelled *D. dubitatus* in key, p. 376 and index, p. 533)

Holotype. ♂ USA, New York, McLean Bogs, Cortland Co., June 20.vi.1936 [CUIC: 4890]. Examined.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *dubitatum*, p. 463 (catalogue); Hurd, 1979: *Dialictus dubitatus*, p. 1966 (catalogue); Moure & Hurd, 1987: *Dialictus dubitatum*, p. 100 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *dubitatum* ♂, p. 114 (redescription, key).

Diagnosis. Male *L. dubitatum* are unique in having metabasitarsus short measuring only about three times as long as broad (Fig. 33B). In other respects male *L. dubitatum* match closely male *L. versatum* (see diagnosis below).

Female unknown.

Range. New York, possibly Ontario, Quebec (Moure & Hurd 1987).

DNA Barcode. Unavailable.

Comments. Rare. Only the holotype is known, although records exist for Ontario and Quebec. The type locality is a bog, which is a habitat infrequently visited by melittologists.

Lasioglossum (*Dialictus*) *eleutherense* (Engel)

Habralictellus eleutherensis Engel, 2001a: 36. ♀ ♂.

Holotype. BAHAMAS, Eleuthera, Rainbow Bay, 1.vii.1987 (D.B. & R.W. Wiley); [FSCA].

Diagnosis. Both sexes of *L. eleutherense* can be recognised by head and mesosoma bright iridescent green, metasoma reddish-orange with dark brown transverse bands, and vein 1rs-m absent resulting in two submarginal cells. The male genital capsule lacks a retrorse lobe (Fig. 2 in Engel 2001a).

Range. Southern Florida, Bahamas, Cuba.

DNA Barcode. Unavailable.

Comments. Rare. Recently collected from Miami, Florida by John Pascarella. *Lasioglossum eleutherense* is the only bright iridescent *Dialictus* known to occur in the United States. Eight species of the bright iridescent group of *Dialictus* (= *Habralictellus*) are known and six were described recently (Engel 2001a; Genaro 2001). For a complete description of *L.* (*D.*) *eleutherense* see Engel (2001a).

Lasioglossum (*Dialictus*) *ellisiae* (Sandhouse)

Halictus (*Chloralictus*) *ellisiae* Sandhouse, 1924: 11. ♀.

Holotype. USA, Massachusetts, Forest Hills, 5.viii.1901, (W.M. Wheeler); [NMNH: 26400]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *ellisiae*, p. 1113 (catalogue); Mitchell, 1960: *Dialictus tegularis* ♀♂ (in part), p. 423 (redescription, key, synonymy); Gibbs, 2009a: *Lasioglossum* (*Dialictus*) *ellisiae* ♀♂, p. 18 (redescription); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *ellisiae* ♀♂, p. 120 (redescription, key).

Diagnosis. Female *L. ellisiae* can be recognised by the following diagnostic combination: tegula enlarged, strongly punctate with distinct posterior angle (Fig. 7A), and mesepisternal punctures separated by smooth interspaces with very little microsculpture. They are most similar to *L. tegulare*, which has strong microsculpture between the mesepisternal punctures.

Male *L. ellisiae* also have an enlarged tegula (Fig. 7A) and can be distinguished from similar species by sparse punctation on T2 immediately basal of premarginal line (Fig. 38B). They are most similar to *L. tegulare*, which has uniformly dense punctures on T2 basal of premarginal line.

Range. Ontario and Massachusetts, west to Minnesota, and south along the Appalachian Mountains to North Carolina. **USA**: IL, IN, MA, ME, MI, MN, NC, NY, PA, WI. **CANADA**: ON.

DNA Barcode. Available. Multiple sequences.

Comments. Common. Until recently, *L. ellisiae* was considered a synonym of *L. tegulare* (Gibbs 2009a, see also Gibbs 2010b). For a complete treatment of *L. ellisiae* and related species in eastern North America see Gibbs (2009a).

Lasioglossum (*Dialictus*) *ephialtum* Gibbs

Lasioglossum (*Dialictus*) *ephialtum* Gibbs, 2010b: 124. ♀♂.

Holotype. ♀ CANADA, Ontario, Toronto, Brunswick Ave., N43.66165 W079.40571, 6.x.2006 (J. Gibbs); [PCYU].

Diagnosis. Female *L. ephialtum* can be recognised by the following diagnostic combination: head moderately wide to round (length/width ratio = 0.95–0.99); mesoscutum imbricate, punctures moderately sparse between parapsidal lines (i=1–2d); mesepisternum rugulose-imbricate; metapostnotal rugae reaching, or nearly reaching, posterior margin; metasomal terga brown, polished due to weak microsculpture; T1 acarinarial fan with distinct dorsal opening; T2–T4 basolaterally with moderately dense tomentum; and T3–T4 with moderately dense apical fringes. They are similar to *L. planatum*, which has shorter metapostnotal rugae except for a single long medial carina, and less abundant pubescence on the metasomal terga.

Male *L. ephialtum* are similar to females but may be further distinguished by flagellomeres elongate (length/width ratio = 1.80–1.85), mesoscutum weakly imbricate, tarsi brownish yellow, metapostnotum strongly rugose, metasomal terga impunctate on apical halves, T2–T4 basolaterally with sparse tomentum, and S2–S5 apicolaterally with moderately dense pubescence. They are similar to *L. laevissimum* and *L. mitchelli*. Male *L. laevissimum* lack tomentum on the metasomal terga and have obscure punctures on the lower portion of the mesepisternum. Male *L. mitchelli* have denser punctures on the metasomal terga that are only absent on the apical impressed areas and the mesoscutum tessellate.

Range. New Brunswick south to West Virginia, west to Manitoba, Colorado. **USA**: CO, CT, DC, IL, IA, IN, MA, MD, ME, MN, NH, NJ, NY, PA, WI, WV. **CANADA**: NB, NS, ON, PQ.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Lasioglossum (*Dialictus*) *fattigi* (Mitchell)

Dialictus fattigi Mitchell, 1960: 392. ♀.

Holotype. ♀ USA, Georgia, Neel Gap, 4.viii.1945 (P.W. Fattig); [NCSU]. Examined.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *fattigi*, p. 463 (catalogue); Hurd, 1979: *Dialictus fattigi*, p. 1966 (catalogue); Moure & Hurd, 1987: *Dialictus fattigi*, p. 100 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *fattigi* ♀♂, p. 129 (redescription, key).

Diagnosis. Female *L. fattigi* can be recognised by the following diagnostic combination: lower paraocular punctures relatively sparse (i=1–1.5d); mesoscutum weakly imbricate, punctures moderately dense between parapsidal lines (i=1–2d); mesepisternum tessellate-imbricate, shallow punctures visible; T1 acarinarial fan with dorsal opening; T1 declivitous surface dull due to distinct coriarious microsculpture; and T3–T4 with sparse tomentum not obscuring surface and weak apical fringes. They are most similar to *L. paradmirandum* and *L. katherineae*. Female *L. paradmirandum* have head less robust, dense punctures on lower paraocular area (i≤d), mesoscutum tessellate, and T3–T4 with relatively dense tomentum partially obscuring surface and strong apical fringes. Female *L. katherineae* have T1 acarinarial fan complete, without dorsal opening.

Male *L. fattigi* are similar to females but may be further distinguished by head elongate (length/width ratio = 1.07); flagellomeres moderately elongate (length/width ratio = 1.62–1.64), pale brownish yellow ventrally; mesepisternum imbricate-tessellate; metapostnotum with posterior margin rounded onto vertical surface; and apical impressed areas of metasomal terga impunctate. They are most similar to *L. mitchelli* and *L. paradmirandum*. Male *L. mitchelli* have posterior margin of metapostnotum distinctly angled, mesoscutum more densely punctate, and mesepisternum rugulose. Male *L. paradmirandum* have head shorter (length/width ratio = 1.03–1.04) and upper portion of mesepisternum weakly reticulate.

Range. Ontario south to Georgia. **USA**: GA, MA, NC, NH, NY. **CANADA**: ON.

DNA Barcode. Available. Multiple sequences.

Comments. *Lasioglossum fattigi* is usually uncommonly collected, however, a long series was examined from the Niagara region of southern Ontario (Richards *et al*. 2011).

Lasioglossum (*Dialictus*) *flaveriae* (Mitchell)

(Figures 98–101)

Dialictus flaveriae Mitchell, 1960: 393. ♀♂.

Holotype. ♀ USA, Florida, Dade Co., Everglades Nat. Pk., 10.iii.1955 on *Flaveria linearis* (H.A. Denmark); [FSCA]. Examined.

Dialictus tahitensis Mitchell, 1960: 421. ♀. **[new synonymy]**

Holotype. ♀ USA, Florida, Dade Co., Tahiti Beach, 29.v.1927 (S. Graenicher); [NCSU]. Examined.

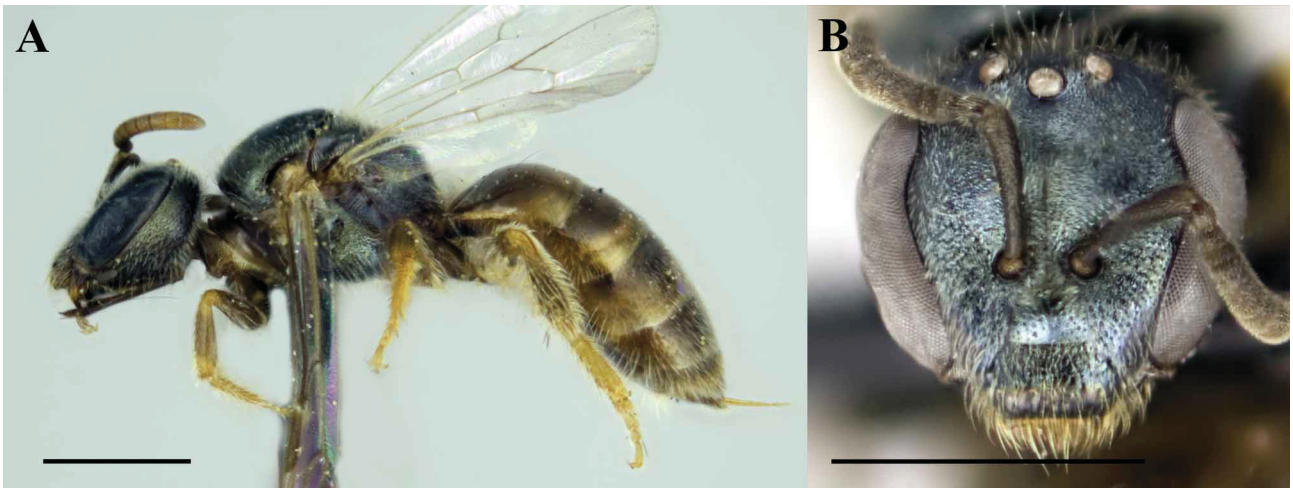

FIGURE 98. *Lasioglossum flaveriae* (Mitchell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

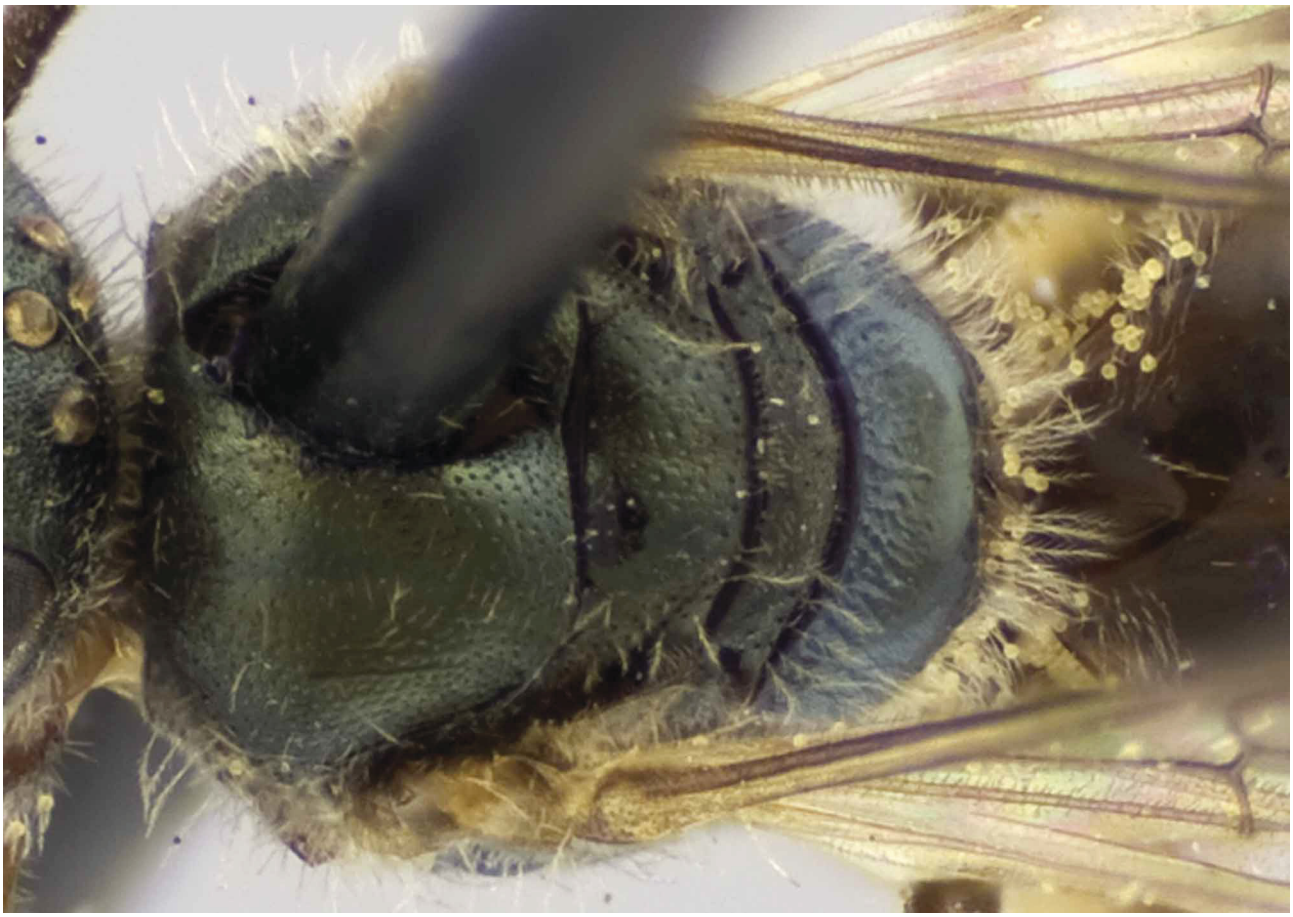

FIGURE 99. *Lasioglossum flaveriae* (Mitchell) female, dorsal view of mesosoma.

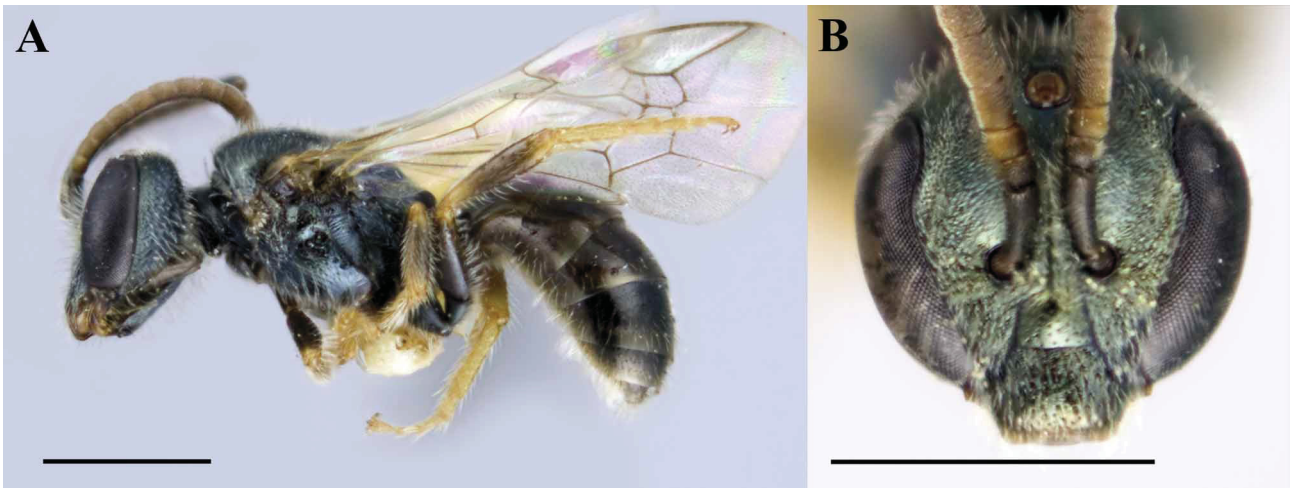

FIGURE 100. *Lasioglossum flaveriae* (Mitchell) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *flaveriae*, p. 463, *L.* (*D*) *tahitense*, p. 466 (catalogue); Moure and Hurd, 1987: *Dialictus flaveriae*, p. 100, *D. tahitensis*, p. 132 (catalogue).

Diagnosis. Both sexes of *L. flaveriae* can be recognised by the following diagnostic combination: metapostnotum smooth, rugae not extending more than halfway to posterior margin (Figs. 99, 101); mesepisternal punctures deep and distinct; gena narrower than eye; and lower paraocular area with sparse tomentum. Males can also be recognized by the elongate S5–S6 hairs visible as two posteriorly directed tufts in dorsal view. They are most similar to the Caribbean species *L. gundlachii* (Baker) which has the surface of the mesoscutum and mesepisternum duller due to microsculpture.

Redescription. FEMALE. Length 4.11–4.66 mm; head length 1.16–1.25 mm; head width 1.18–1.32 mm; forewing length 2.78–3.27 mm.

Colouration. Head and mesosoma pale green to blue. Clypeus with apical half blackish brown. Antenna dark brown, flagellum with ventral surface brownish yellow. Tegula reddish brown. Wing membrane subhyaline, venation and pterostigma yellowish brown. Legs brown except tarsi, and apical and basal portions of tibiae brownish yellow. Metasoma reddish brown, terga and sterna with apical margins translucent brownish yellow.

Pubescence. Dull white. Moderately sparse. Head and mesosoma with moderately sparse woolly hairs (1–2 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena with sparse subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately sparse, fine hairs. T1 acarinarial fan limited to small lateral area, dorsal opening wider than lateral patches. T1–T6 without tomentum. T2 apicolateral and T3–T4 apical margins with sparse apical fringes.

Surface sculpture. Face imbricate, punctation very fine. Clypeus with apical half polished, punctation moderately sparse apically (i=1–2d), denser basally (i≤d). Supraclypeal area with punctation moderately sparse (i=1–2d), denser laterally. Lower paraocular area punctation dense (i≤d). Antennocular area punctation moderately dense (i=1–1.5d). Upper paraocular area and frons very finely punctate. Ocellocular area punctate (i=1–1.5d). Gena lineolate. Postgena imbricate. Mesoscutum weakly imbricate, polished submedially, punctation moderately sparse between parapsidal lines (i=1–2.5d), dense laterad of parapsidal line (i≤d), contiguous on anterolateral portion. Mesoscutellum similar to mesoscutum, submedial punctation sparse (i=1.5–3d). Axilla minutely punctate. Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate-punctate (i=1–1.5d). Mesepisternum weakly imbricate, distinctly punctate (i=1–2d). Metepisternum with upper half carinulate and ventral portion imbricate. Metapostnotum with short rugae not extending halfway to posterior margin, posterior margin weakly imbricate. Propodeum with dorsolateral slope imbricate, lateral and posterior surfaces tessellate-imbricate. Metasomal terga polished, punctation moderately sparse basally (i=1–2d), more widely spaced apically (i=1–2.5d), T2 apical impressed area impunctate.

Structure. Head moderately wide (length/width ratio = 0.95–0.99). Eyes convergent below (UOD/LOD ratio = 1.27–1.30). Clypeus 1/2–2/3 below suborbital tangent, apicolateral angle convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2–2.5 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum moderately elongate (MMR ratio = 1.10–1.20), posterior margin rounded onto posterior surface. Propodeum with oblique carina absent, lateral carina not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 3.63–3.93 mm; head length 1.25–1.28 mm; head width 1.22–1.26 mm; forewing length 3.15–3.21 mm.

Colouration. Flagellum with ventral surface reddish brown. Legs brown, except tibial bases and apices, and tarsi brownish yellow, pro- and mesotibiae sometimes infused with brownish yellow.

Pubescence. S2–S4 apical halves with moderately dense hairs (1.5 OD), S5–S6 lateral portions with medially directed elongate hairs (3–4 OD).

Surface sculpture. Punctation coarser. Metasomal terga with apical impressed areas impunctate.

Structure. Head moderately elongate (length/width ratio = 1.02). Eyes strongly convergent below (UOD/LOD ratio = 1.45–1.48). Clypeus 2/3 below suborbital tangent, apicolateral margins convergent. Antennal sockets distant (IAD/OAD > 1.1). Frontal line carinate, ending 2 OD below median ocellus. Pedicel subequal to F1. F2 length 1.3–1.4X F1. F2–F10 short (length/width ratio = 1.15–1.30). Metapostnotum moderately elongate (MMR ratio = 1.20), posterior margin rounded onto posterior surface. Propodeum with oblique carina absent.

Terminalia. Gonostylus posteriorly directed, very long setae emerging from base. Retrorse lobe short.

Range. Bahamas, Florida (Fig. 102).

Additional material examined. BAHAMAS: Gorda Cay, N26°05′ W77°32′, 14–20.vi.1998 (S. Glasscock); [UCFC]; **USA**: FLORIDA: 2♀♀ Flamingo, Everglades N.P., 1–5.xii.1961 (Munroe, Holland & Chillcott); [CNC]; 1♀ *paratype* Dade Co., Everglades Nat. Pk., 10.iii.1955 (H.A. Denmark); 1♀ *paratype* Dade Co., Everglades Nat. Pk., 11.iii.1955 (H.A. Denmark); 2♂♂ *paratype*s Cape Sable, Everglades N.P., 25.iii.1954 on salt flats (K.V. Krombein); 3♀♀ *paratypes* Paradise Key, 6.iv.1951 (H. & M. Townes); [CUIC]; 1♀ Mahogany Hammock, Everglades N.P., 4.xii.1970 (J. Powell); [EMEC];1♂ *allotype*, Dade Co., Everglades Nat. Pk., 17.iii.1955 on *Lyonia mariana* (H.A. Denmark); [FSCA]; 1♂ *paratype* Cape Sable, Everglades N.P., 25.iii.1954 on salt flats (K.V. Krombein); 4♀♀ *paratypes* Dade Co., Everglades Nat. Pk., 11.iii.1955 (H.A. Denmark); 1♀ *paratype* Matheson Hammock, 8.iv.1955 (T.B. Mitchell); 3♀♀ *paratypes* Paradise Key, 6.iv.1951 (H. & M. Townes); [NCSU]; 1♀ *paratype*, Cape Sable, Everglades N.P., 25.iii.1954 on salt flats (K.V. Krombein); 1♂ *paratype*, Paradise Key, Everglades N.P., 22.iii.1954 (K.V. Krombein); [NMNH]; 1♀ Lee Co., N26.4479 W082.0407, 5.vi.2007 (S.W. Droege); 1♀ Lee Co., N26.4419 W082.0803, 5.vi.2007 (S.W. Droege); 1♀ Martin Co., N27.0863 W080.1248, 4.vi.2007 (S.W. Droege); [PCYU].

FIGURE 101. *Lasioglossum flaveriae* (Mitchell) male, dorsal view of mesosoma.

Floral records. AMARANTHACEAE: *Achyranthes "mercantifolia"*; ASTERACEAE: *Flaveria linearis*, *Mikania*, *Sartwellia flaveriae*; ERICACEAE: *Lyonia mariana*.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon.

The holotype specimens of *Dialictus flaveriae* and *D. tahitensis* differ only in size and colouration. Neither of these characters is reliable for delimiting *Dialictus* species and colour is often affected by preservation. Both holotypes have brownish orange metasomata but this might be an artefact. Paratypes and recently collected material have the metasoma reddish brown.

The West Indian species *L. gundlachii* is very similar to *L. flaveriae* both morphologically and based on DNA barcodes. Several Floridian species also occur in Cuba and islands of the West Indies (*e.g. L. eleutherense* discussed above and *L. halophitum* below). Jamaican specimens of *L. gundlachii* were found to have more microsculpture on the mesosoma than does *L. flaveriae*. These two species show affinities to mainland Neotropical species (see Danforth *et al*. 2003).

***Lasioglossum* (*Dialictus*) *floridanum* (Robertson)**

(Figures 103–107)

Halictus floridanus Robertson, 1892: 269. ♀.

Lectotype. ♀ USA, Florida, Inverness, 7.iii.1891 (C. Robertson); [INHS: 10232] by W. E. LaBerge (in Webb 1980). Examined.

Dialictus intrepidus Mitchell, 1960: 437. ♂.

Holotype. ♂. USA, Georgia, Stone Mountain, 7.vi.1917; [CUIC: 4891]. Examined.

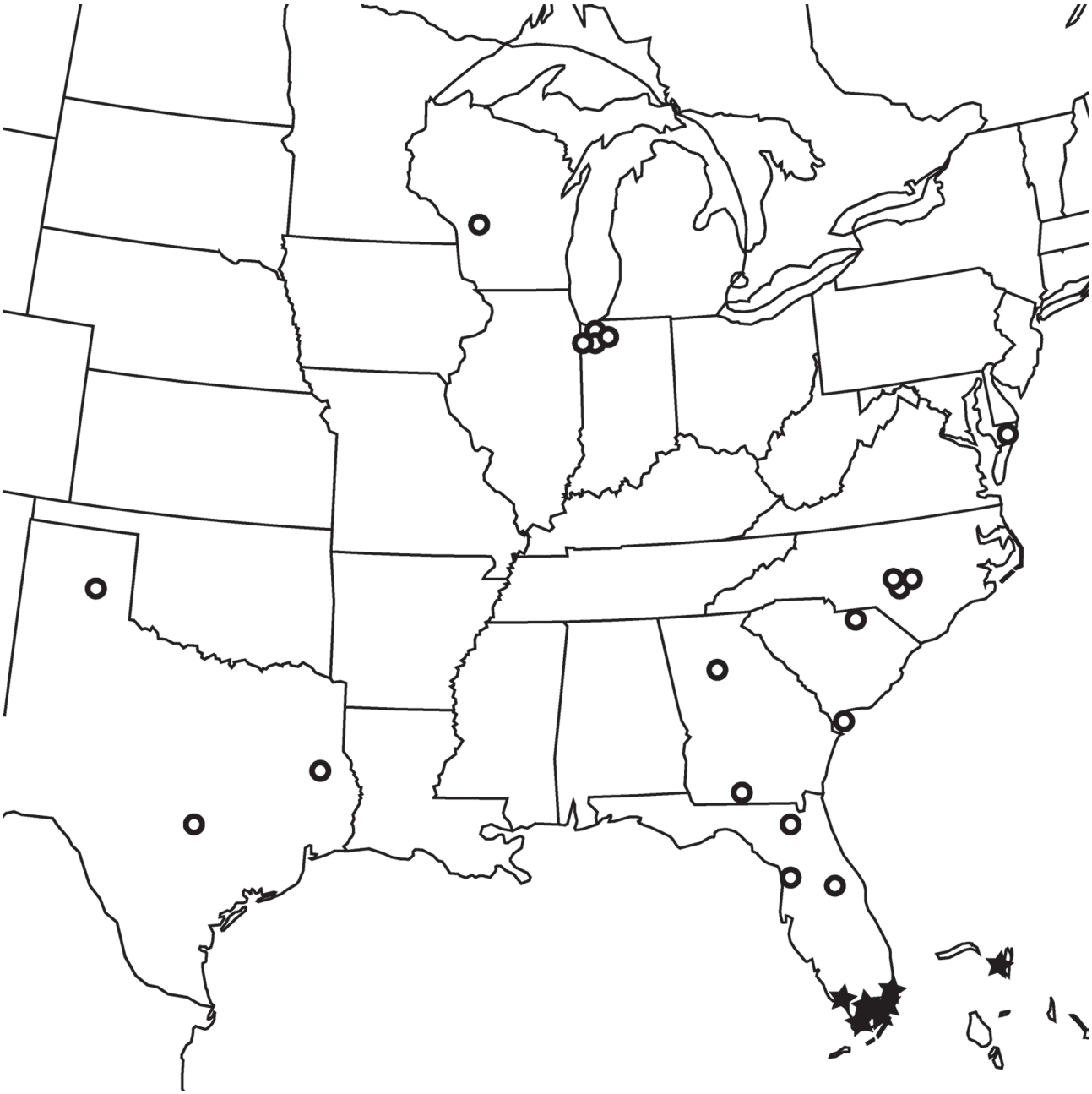

FIGURE 102. Distribution map of *Lasioglossum flaveriae* (stars) and *L. floridanum* (circles).

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *floridanum floridanum*, p. 1113 (catalogue); Mitchell, 1960: *Dialictus pilosus floridanus*, p. 414 (key, tax. char.); Krombein, 1967: *Lasioglossum* (*Dialictus*) *pilosum floridanum*, p. 465 (catalogue); Moure and Hurd, 1987: *Dialictus pilosus floridanus*, p. 123 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *floridanum*, p. 258 (tax. notes, synonymy).

Diagnosis. Female *L. floridanum* can be recognised by the following diagnostic combination: head elongate (length/width ratio = 1.08–1.10) (Fig. 103B); clypeus with apicolateral margins subparallel (Fig. 103B); mesoscutal punctures dense (i<d) (Fig. 104); metapostnotal rugae fine, relatively indistinct from surrounding microsculpture; metasomal terga metallic; T2 without apical fringe medially; and T3 with sparse tomentum apically. They are most similar to *L. pilosum*, which has strong metapostnotal rugae, T2 with apical fringe medially, and dense tomentum obscuring the disc of T3.

Male *L. floridanum* can be recognised by the head elongate (length/width ratio = 1.17) (Fig. 105B); eyes strongly convergent below (UOD/LOD ratio = 1.54); clypeus with distal margin brown, sometimes yellow; mesoscutal punctures dense (Fig. 106); metapostnotal rugae weak; and metasomal terga metallic, punctation dense and distinct. They are most similar to *L. pilosum* and *L. succinipenne*, both of which have clypeus with yellow distal band and metapostnotal rugae.

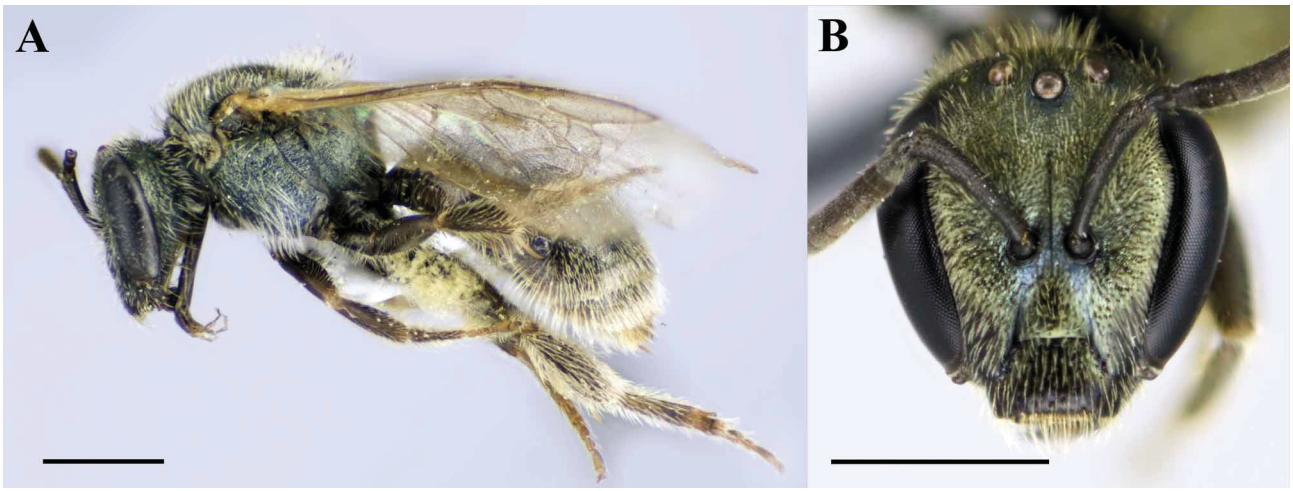

FIGURE 103. *Lasioglossum floridanum* (Robertson) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Redescription. FEMALE. Length 4.70–6.66 mm; head length 1.73–1.92 mm; head width 1.60–1.75 mm; forewing length 3.93–4.36 mm.

Colouration. Head and mesosoma pale green to golden green. Clypeus with apical half blackish brown. Supraclypeal area bronze. Antenna dark brown, flagellum with ventral surface reddish brown at apex. Tegula amber. Wing venation and pterostigma pale amber. Legs brown, except protibial base and medio- and distitarsi reddish brown. Metasomal terga golden green, sterna brown, apical margins pale, translucent yellow.

FIGURE 104. *Lasioglossum floridanum* (Robertson) female, dorsal view of mesosoma.

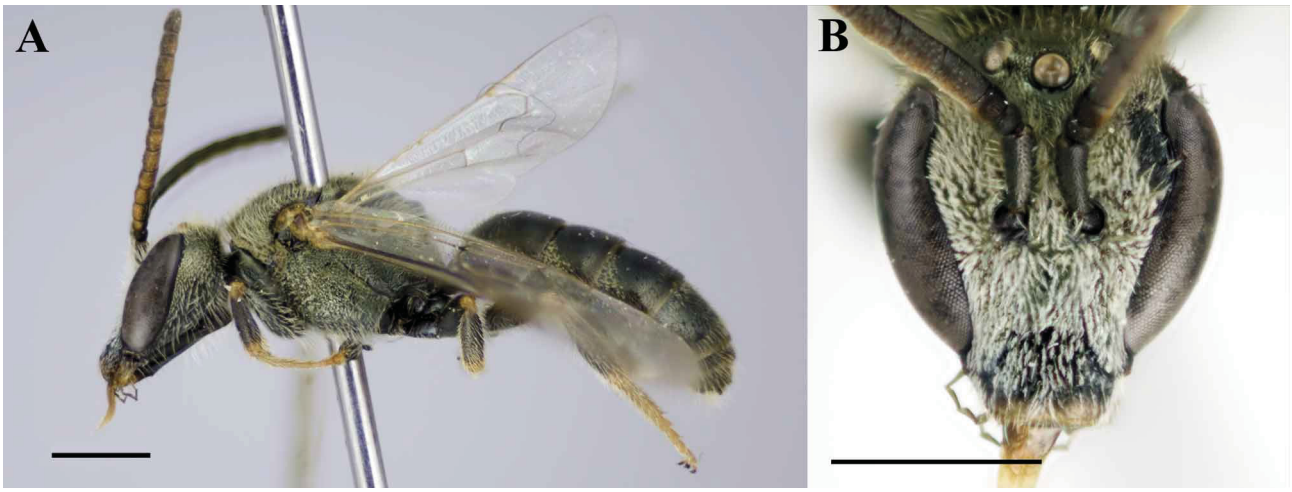

FIGURE 105. *Lasioglossum floridanum* (Robertson) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 106. *Lasioglossum floridanum* (Robertson) male, dorsal view of mesosoma.

Pubescence. Dull white to yellowish. Dense. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena with subappressed tomentum sometimes partially obscuring surface. Mesoscutum with dense hairs. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with dense, fine hairs. T1 acarinarial fan complete and dense. T1 apicolateral portion with tomentum. T2 basal and lateral portions, T3 basal, lateral and apicolateral portions, T4–T5 with dense tomentum obscuring surface. T2–T4 apical margins with moderately dense fringes.

Surface sculpture. Face imbricate, punctation fine. Clypeus polished, imbricate, punctation (i=1–2d). Supraclypeal area with punctation moderately dense (i=1–1.5d). Lower paraocular and antennocular areas with punctation dense (i≤d).

Upper paraocular area and frons punctate-reticulate. Ocellocular area minutely punctate-reticulate. Gena and postgena lineolate. Mesoscutum tessellate-imbricate, punctation dense on medial portion of disc (i<d), punctate-reticulate mesad and laterad of parapsidal line and on anterolateral portion. Mesoscutellum weakly imbricate, submedial punctation moderately dense (i=1–1.5d). Axilla punctate. Metanotum ruguloso-imbricate. Preëpisternum rugulose. Hypoepimeral area rugulose. Mesepisternum weakly rugulose. Metepisternum with upper half rugoso-carinulate, lower half imbricate. Metapostnotum with weak rugae, posterior margin tessellate. Propodeum with dorsolateral slope rugulose, lateral and posterior surfaces rugulose-tessellate. Metasomal terga weakly coriarious, punctation moderately dense throughout (i=1–1.5d).

Structure. Head elongate (length/width ratio = 1.08–1.10). Eyes convergent below (UOD/LOD ratio = 1.20–1.26). Clypeus ½ below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 4 branches. Metapostnotum truncate (MMR ratio = 1.28–1.38), posterior margin weakly angled onto posterior surface. Propodeum with oblique carina fine, lateral carina weak, not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 5.51 mm; head length 1.78 mm; head width 1.51 mm; forewing length 4.05 mm.

Colouration. Labrum brownish yellow. Mandible brownish yellow. Clypeus distal margin yellowish brown (rarely brown). Flagellum with ventral surface ferruginous. Legs brown, except tibial bases and apices and tarsi brownish yellow.

Pubescence. Moderately dense. Face below eye emargination with tomentum obscuring paraocular area, partially obscuring clypeus and supraclypeal area. T1 acarinarial area with sparse fan of appressed hairs. T2–T3 basolaterally and T4 basally with sparse tomentum. S2–S3 entirely and S4 laterally with posteriorly directed hair patches (1–1.5 OD).

Surface sculpture. Clypeal punctation moderately dense (i=1–2d). Propodeum with dorsolateral slope and lateral and posterior surfaces rugulose. Metasomal terga punctation deep, distinct.

Structure. Head very elongate (length/width ratio = 1.17). Eyes strongly convergent below (UOD/LOD ratio = 1.54). Clypeus 2/3 below suborbital tangent, apicolateral margins subparallel. Antennal sockets distant (IAD/OAD = 1.0). Frontal line carinate, ending 2OD below median ocellus. Pedicel shorter than F1. F2 length 1.5X F1. F2–F10 moderately elongate (length/width ratio = 1.33–1.50). Metapostnotum truncate (MMR ratio = 1.45), posterior margin weakly angled onto posterior surface.

Terminalia. S7 with median lobe clavate, apex rounded (Fig. 107). S8 with apicomedial margin weakly convex (Fig. 107). Genital capsule as in Fig. 107. Gonobase with ventral arms narrowly separated. Volsella roughly ovoid. Gonostylus small, dorsal setae elongate. Retrorse lobe elongate, strongly attenuated apically.

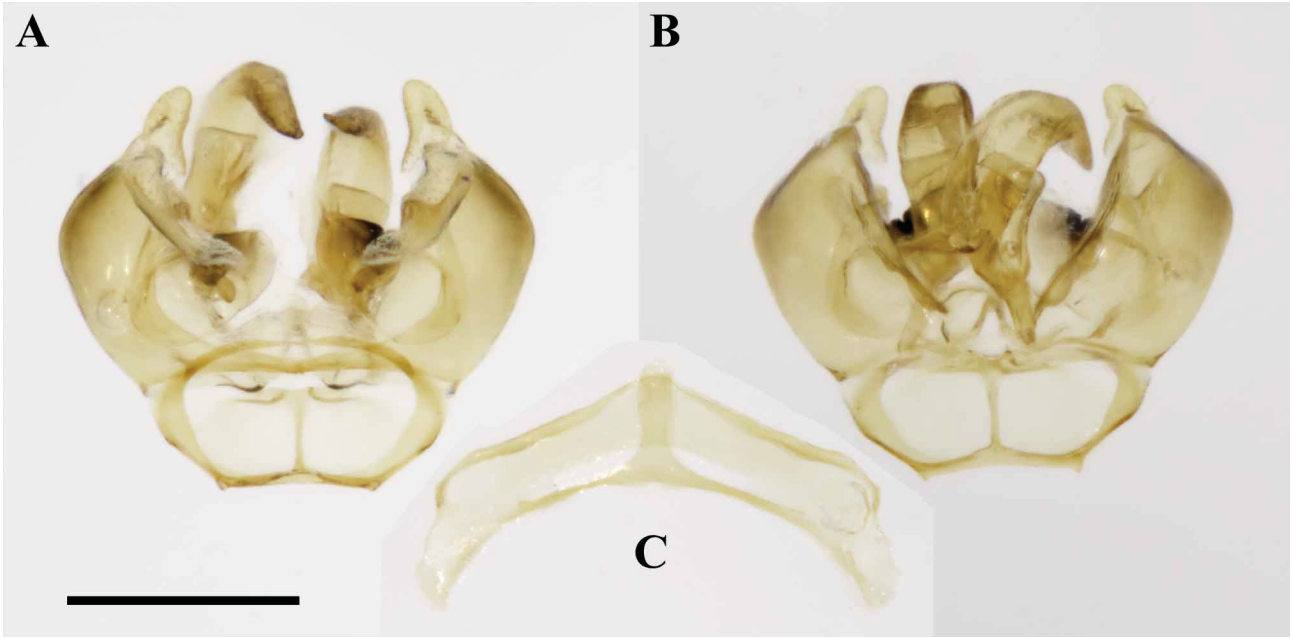

FIGURE 107. *Lasioglossum floridanum* (Robertson) male terminalia, (A) ventral view, (B) dorsal view, (C) S7 and S8. Scale bar = 0.5 mm.

Range. Wisconsin south to Florida, west to Texas (Fig. 102). **USA**: FL, GA, IN, MD, NC, OK, SC, TX, WI.

Additional specimens examined. USA: FLORIDA: 1♀ Union Co., 3.i.1930 (R.B. Howard); [CUIC]; 15♀♀ *paratypes*, Inverness, (C. Robertson); [INHS]; 1♀ Inverness, (C. Robertson); [UCMC]; GEORGIA: 3♀♀ 1♂ Pavo, N30.941 W083.708, 2.vi.2005 (A. Zayed); [PCYU]; INDIANA: 1♀ Porter Co., Indiana Dunes N.L., Ogden Dunes, N41°37′0″ W87°11′51″, 22.vi.2004 (R. Grundel); 1♀ Porter Co., Indiana Dunes N.L., Ogden Dunes, N41°37′0″ W87°11′51″, 23.vii.2003 (R. Grundel); 2♀♀ Jasper Co., Tefft Savanna, N41°9′25″ W86°58′41″, 28.iv.2004 (R. Grundel); 2♀♀ Jasper Co., Tefft Savanna, N41°9′25″ W86°58′41″, 14.vii.2003 (R. Grundel); [IDNL]; 1♀ Jasper Co., Nipsco, 17.vii.2001 (R.P. Jean); 1♀ Newton Co., Conrad, 4.vi.2003 (R.P. Jean); 1♀ Starke Co., Ober, 29.vi.2001 (R.P. Jean); [PCYU]; MARYLAND: 1♀ Worcester Co., Pocomoke River S.F., sand dune, N38.23882 W075.58212, 18–20.ix.2009 (J. & F. Frye); [CUIC]; NORTH CAROLINA: 18♀♀ Hoke Co., Fort Bragg Mil. Res., 10–13.vi.1998 (B.N. Danforth); [CUIC]; 1♀1♂ Spout Spring, 25.x.1952 (T.B. Mitchell); [CUIC]; 3♀♀ S. of Lillington, 29.iii.1945; [NCSU]; SOUTH CAROLINA: 1♀ Aiken, 13.vi.1957 (J.R. Vockeroth); 1♀ Hilton Head Is., 11–23.vii.1965 (H.F. Howden); [CNC]; 1♀ Chesterfield Co., N34.5836 W080.24529, 18.v.2006 (S.W. Droege); 3♀♀ Chesterfield Co., N34.5305 W080.2223, 6–8.ix.2006 (S.W. Droege); [PCYU]; TEXAS: 1♀1♂ Bastrop Co., Bastrop S.P., 3.viii.1988 (J.L. Neff); [CTMI]; 1♀ Donley Co., Lake McClellan, 28.vii.1972 (G.C. Eickwort); 1♀ Nacogdoches Co., N31.5011 W094.7839, 16–30.vi.2010 (C. Adams); [CUIC]; WISCONSIN: 1♀ Monroe Co., N44.1465 W090.6948, 15–19.vii.2010 (H. Gaines).

Floral records. ASTERACEAE: *Chrysopsis*, *Cirsium*, *Coreopsis palmata*, "*Haplopappus"*, *Pyrrhopappus*, *Silphium*; ERICACEAE: *Vaccinium*; EUPHORBIACEAE: *Euphorbia corollata*; FABACEAE: *Amorpha*, *Baptisia*, *Galactia*; ROSACEAE: *Photinia*, *Crataegus*, *Rubus*; SCROPHULARIAE: *Aureolaria pedicularia*; UNCERTAIN: "*Gerardia*".

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon.

Mitchell (1960) and others have considered *L. floridanum* to be a subspecies of *L. pilosum*. The degree of morphological differentiation between *L. floridanum* and *L. pilosum* is similar to that between other species of *L.* (*Dialictus*) and DNA barcodes distinguish the two species. As such, full species-level status has been given to *L. floridanum* (see Gibbs 2010b).

Lasioglossum (*Dialictus*) *foveolatum* (Robertson)

Chloralictus foveolatus Robertson, 1902b: 250. ♂.

Lectotype. ♂ USA, Illinois, Macoupin Co., Carlinville, 31.x.1901 (C. Robertson); [INHS: 23049] by W. E. LaBerge (in Webb 1980). Examined.

Dialictus supraclypeatus Mitchell, 1960: 420. ♀.

Holotype. ♀ USA, Virginia, Dunn Loring, 26.vi.1948, (K.V. Krombein); [NMNH: 66071]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *foveolatum*, p. 1113 (catalogue); Mitchell, 1960: *Dialictus foveolatus* ♂, p. 394 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *foveolatum*, p. 463, *L.* (*D.*) *supraclypeatum*, p. 466 (catalogue); Hurd, 1979: *Dialictus foveolatus*, p. 1966, *D. supraclypeatus*, p. 1972 (catalogue); Moure & Hurd, 1987: *Dialictus foveolatus*, p. 101, *D. supraclypeatus*, p. 132 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *foveolatum* ♀♂, p. 132 (redescription, key, synonymy).

Diagnosis. Both sexes of *L. foveolatum* can be distinguished by parapsidal line deep and wide, equal to about three puncture diameters (Fig. 15B). Female *L. foveolatum* may be further distinguished by supraclypeal area strongly convex and lower paraocular area tessellate with sparse punctures (i=1–2d). They are most similar to *L. ceanothi,* which have parapsidal line narrow and lower paraocular punctures denser. Male *L. foveolatum* have mesepisternal punctures distinct, and sometimes propodeal lateral surfaces punctate, too.

Range. Southern Ontario and Connecticut, south to Georgia, west to Missouri. **USA**: CT, GA, IL, IN, MD, MO, NJ, VA, WI. **CANADA**: ON.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon.

FIGURE 108. *Lasioglossum furunculum* Gibbs female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

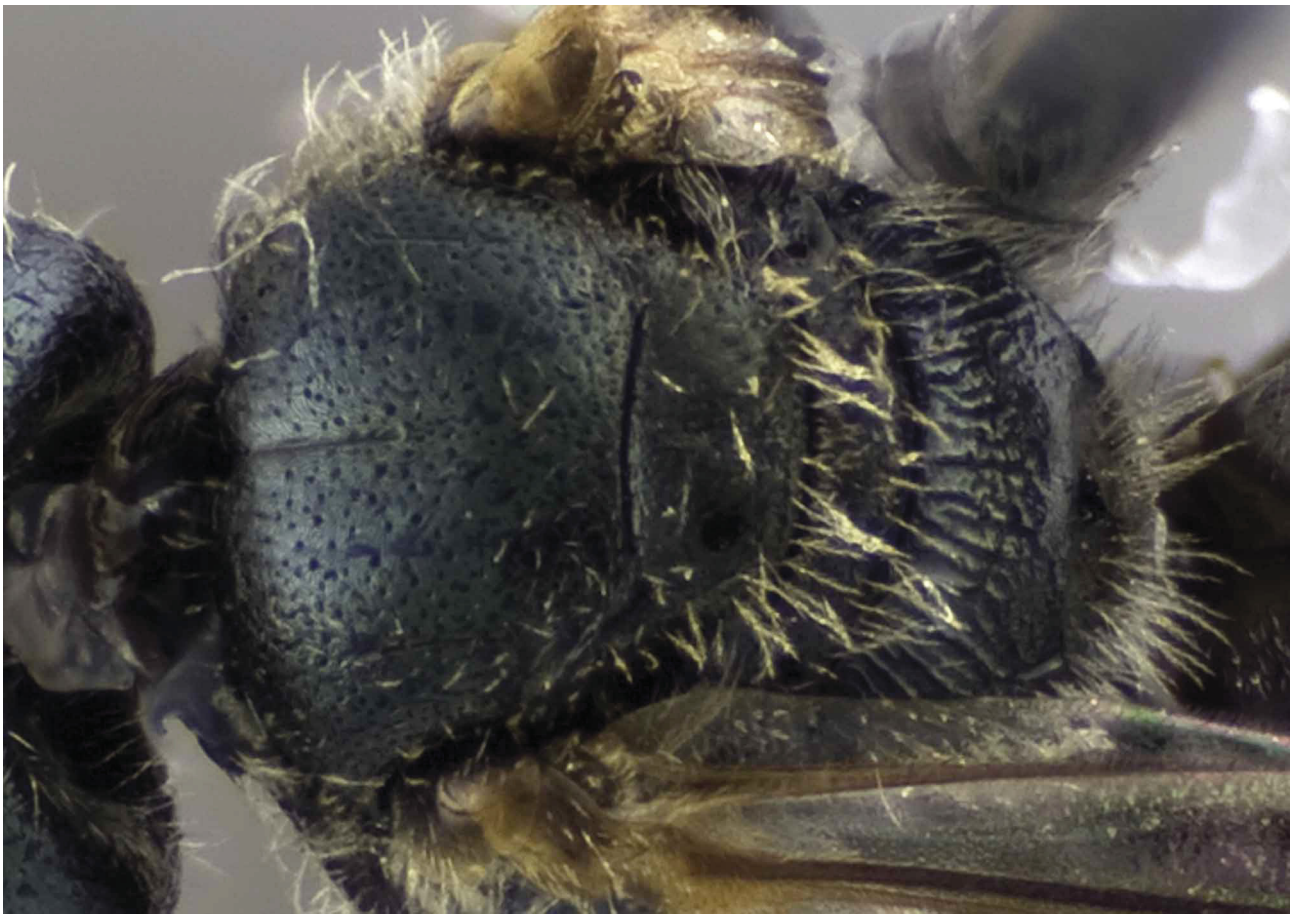

FIGURE 109. *Lasioglossum furunculum* Gibbs female, dorsal view of mesosoma.

Lasioglossum (*Dialictus*) *furunculum* Gibbs, new species

(Figures 108–109)

Holotype. ♀ USA, Massachusetts, Franklin Co., Montague WMA, Pt. 108, treated pitch-pine, N42. 56767 W072.51897, 5–6.x.2009 (J. Milam); [PCYU].

Diagnosis. Female *L. furunculum* can be recognised by the following diagnostic combination: labrum with apical process flat, dorsal keel absent (Fig. 6B); mandible without preapical tooth; gena subequal to eye in width; and inner metatibial spur with four branches. They are most similar to *L. izawsum* and *L. simplex*. Female *L. simplex* lack a carinate pronotal ridge. Female *L. izawsum* has a distinct preapical tooth on the mandible and usually three branches on the inner metatibial spur.

Male unknown.

Description. FEMALE. Length 4.69 mm; head length 1.35 mm; head width 1.61 mm; forewing length 3.63 mm.

Colouration. Head and mesosoma blue to bluish green. Clypeus with apical 1/2 blackish brown. Antenna dark brown, ventral surface reddish brown. Tegula reddish brown to brownish yellow. Wing subhyaline, venation and stigma dark yellowish brown. Legs brown, except metabasitarsus yellowish brown, tarsi reddish brown. Metasoma dark brown, terga and sterna with apical margins translucent, brownish yellow.

Pubescence. Dull white. Sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Inner eye margin with subappressed hairs. Pronotal collar without dense tomentum. Propodeum with moderately sparse plumose hairs on lateral and posterior surfaces (1.5–2 OD). Mesofemoral and mesotibial combs dense but short relative to non-parasitic species. Metafemoral scopa reduced relative to nest-building species, only a few elongate hairs curving above ventral surface. Penicillus greatly reduced, indistinguishable from other hairs. Metasomal terga with moderately sparse, fine hairs. T1 acarinarial fan with dorsal opening subequal to width of lateral hair patches. T2–T3 basolaterally and T4 entirely with very sparse tomentum. T2 apicolateral and T3–T4 apical margins with very sparse fringes. Sternal hairs erect, posteriorly directed (1.5–2.5 OD).

Surface sculpture (partially obscured). Face polished, punctation fine. Clypeus with punctation sparse (i=1.5–3d). Supraclypeal area with punctation moderately sparse (i=1–2.5d). Lower paraocular and antennocular areas with punctation moderately sparse (i=1–1.5d). Upper paraocular area and frons with punctation contiguous. Ocellocular area punctate (i=1–1.5d). Gena lineolate. Postgena imbricate. Mesoscutum weakly imbricate, more polished posteriorly, punctation fine, sparse between parapsidal lines (i=1–2.5d), denser laterad of parapsidal line (i≤d) and contiguous on anterolateral portion. Mesoscutellum similar to mesoscutum, submedial punctation sparse (i=1–3d). Axilla punctate. Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area ruguloso-imbricate. Mesepisternum dorsal half rugulose, ventral half imbricate. Metepisternum with dorsal 1/3 carinulate, ventral 2/3 imbricate. Metapostnotum nearly completely rugoso-carinulate, posterior margin imbricate. Propodeum with dorsolateral slope rugulose-imbricate, lateral surface imbricate, posterior surface imbricate-tessellate. Metasomal terga polished except apical impressed areas faintly coriarious, punctation dense basally (i=1–1.5d), obscured apically.

Structure. Head very wide (length/width ratio = 0.84). Eyes convergent below (UOD/LOD ratio = 1.17). Labrum enlarged and flattened with distinct basal tubercle, apical process without dorsal keel. Mandible slender, extending beyond opposing clypeal angle, preapical tooth small. Clypeus 1/3 below suborbital tangent, apicolateral margins strongly convergent. Antennal sockets distant (IAD/OAD > 0.6). Frontal line carinate, ending 2 OD below median ocellus. IOD subequal to OOD. Gena subequal to eye. Pronotal dorsolateral angle obtuse. Pronotal ridge carinate. Basitibial plate with apical carina weak. Inner metatibial spur pectinate with 4 short branches. Metapostnotum moderately elongate (MMR ratio = 1.18), posterior margin narrowly rounded onto posterior surface. Propodeum with oblique carina very weak, lateral carina not reaching dorsal margin. T5 medial specialized area reduced in size relative to non-parasitic species.

MALE. Unknown.

Range. Massachusetts (Fig. 120).

DNA barcode. Unavailable.

Comments. Rare. *Lasioglossum furunculum* is presumed to be a social parasite or cleptoparasite of nest-building *L.* (*Dialictus*).

Due to the close similarity of *L. furunculum* and *L. izawsum*, their collection in the same study, and the partially obscured sculpture of the *L. furunculum* holotype, the former is described here with some trepidation. It is conceivable that *L. furunculum* is only an unusual specimen of *L. izawsum*, however, in addition to the tooth and spur characters, the inner surface of the metabasitarsus differs in colour between the two nominal taxa. The congruence between these three characters suggests that both species may be valid.

FIGURE 110. *Lasioglossum georgeickworti* Gibbs female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Lasioglossum (*Dialictus*) *georgeickworti* Gibbs, new species
(Figures 110–114)

Holotype. 1♀ USA, Massachusetts, Franklin Co., Montague WMA, gravel pit, N42.56957 W072.53617, 29–30.vii.2008 (J. Milam); [PCYU].

Diagnosis. Female *L. georgeickworti* have a unique T1 acarinarial fan, which lacks a dorsal opening but has an inverted triangle-shaped glabrate area subdorsally. Additional characters for distinguishing *L. georgeickworti* include head wider than long (length/width ratio = 0.97–0.98); mesoscutal punctures sparse between parapsidal lines (i=1–2d) (Fig. 111); mesepisternum rugulose, obscurely punctate (i=1–1.5d); metapostnotal rugae reaching posterior margin; metasomal terga with distinct punctures throughout (i=1–2d); T2–T3 basolaterally and T4 entirely with tomentum (Fig. 110A); apical impressed areas amber basally, translucent pale brownish yellow apically.

Male *L. georgeickworti* can be recognised by the following diagnostic combination: head slightly elongate (length/width ratio = 1.01–1.03); face below eye emargination with dense tomentum (Fig. 112B); mesoscutum polished, punctures moderately sparse between parapsidal lines (i=1–2d); mesepisternum with relatively distinct punctures; tegula and tarsi orange to brownish yellow (Fig. 112A); metapostnotal rugae reaching angulate posterior margin (Fig. 113); and metasomal terga with apical impressed areas virtually impunctate.

Description. FEMALE. Length 5.26–5.57 mm; head length 1.49–1.64 mm; head width 1.52–1.68 mm; forewing length 3.45–3.69 mm.

Colouration. Head and mesosoma pale blue, sometimes greenish blue. Clypeus basal half blackish brown. Antenna dark brown, flagellum with ventral surface reddish brown, F8–F10 sometimes with ventral surface orange-yellow. Tegula amber to reddish brown. Wing membrane hyaline, venation and pterostigma pale brownish yellow. Legs brown, except medio- and distitarsi reddish brown. Metasoma dark brown, terga and sterna with apical margins amber to translucent brownish yellow.

Pubescence. Dull white. Moderately sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Lower paraocular area and gena with sparse, subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with dense, fine hairs. T1 acarinarial fan large without dorsal opening but interrupted subdorsally with glabrate patch. T2–T3 basolateral portions and T4 entirely with tomentum partially obscuring surface. T2 apicolateral and T3–T4 apical margins with relatively dense apical fringes.

Surface sculpture. Face weakly imbricate, punctation moderately fine. Clypeus with apical half polished, punctation sparse (i=1–3d). Supraclypeal area with punctation sparse (i=1–1.5d). Lower paraocular area punctation dense (i≤d). Antennocular area punctation moderately dense (i≤1.5d). Upper paraocular area and frons reticulate-punctate. Ocellocular area obscurely punctate (i=1–1.5d). Gena polished, weakly lineolate. Postgena polished. Mesoscutum weakly imbri-

cate, polished posteriorly, punctation fine, moderately sparse between parapsidal lines (i=1–2d), dense laterad of parapsidal line (i≤d), reticulate on anterolateral portion. Mesoscutellum similar to mesoscutum, submedial punctation sparse(i=1–4d). Axilla punctate. Metanotum rugulose-imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate. Mesepisternum dorsal portion rugulose-imbricate, ventral portion weakly imbricate, punctation obscure (i=1–1.5d). Metepisternum with dorsal portion carinulate, ventral portion imbricate. Metapostnotum rugoso-carinulate, nearly reaching posterior margin. Propodeum with dorsolateral slope imbricate, lateral and posterior surfaces tessellate-imbricate. Metasomal terga polished, punctation dense and distinct throughout (i=1–2d).

Structure. Head wide to elongate (length/width ratio = 0.97–0.98). Eyes convergent below (UOD/LOD ratio = 1.21–1.24). Clypeus 2/3 below suborbital tangent, apicolateral margins convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum moderately elongate (MMR ratio = 1.21–1.25), posterior margin narrowly rounded onto posterior surface. Propodeum with oblique carina very weak, lateral carina weak, not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 4.54–5.32 mm; head length 1.37–1.56 mm; head width 1.36–1.51 mm; forewing length 3.45–3.81 mm.

Colouration. Labrum and mandible amber. Clypeus with distal margin narrowly amber. Flagellum with ventral surface brownish yellow. Pterostigma reddish brown. Legs brown, except tibial apices, metatibial base and tarsi yellowish brown.

Pubescence. Paraocular area below eye emargination and clypeus basally with dense tomentum obscuring surface. T2–T4 basolaterally with sparse, scattered tomentum. S3 apically and S4–S5 laterally with moderately dense plumose hairs oriented posteromedially (1–1.5 OD).

FIGURE 111. *Lasioglossum georgeickworti* Gibbs female, dorsal view of mesosoma.

Surface sculpture. Metanotum rugose. Preëpisternum and hypoepimeral area rugulose. Mesepisternum with dorsal portion rugulose-punctate, ventral portion weakly imbricate-punctate. Metapostnotum coarsely and completely rugose. Propodeum rugose. Metasomal terga with apical impressed areas impunctate, at most a few scattered punctures.

FIGURE 112. *Lasioglossum georgeickworti* Gibbs male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 113. *Lasioglossum georgeickworti* Gibbs male, dorsal view of mesosoma.

Structure. Head slightly elongate (length/width ratio = 1.01–1.03). Eyes strongly convergent below (UOD/LOD ratio = 1.46–1.57). Labrum not emarginate. Antennal sockets moderately distant (IAD/OAD > 1.3). Frontal line carinate, ending 2 OD below median ocellus. Pedicel shorter than F1. F2 length 1.8–2.1X F1. F2–F10 moderately elongate (length/width ratio = 1.57–1.80). Metapostnotum elongate (MMR ratio = 1.12–1.19), posterior margin sharply angled onto posterior surface.

Terminalia. S7 with median lobe columnar, apex rounded (Fig. 114). S8 with apicomedial margin weakly convex (Fig. 114). Genital capsule as in Fig. 114. Gonobase with ventral arms narrowly separated. Volsella roughly ovoid. Gonostylus small, dorsal setae elongate. Retrorse lobe narrow, attenuated and recurved apically.

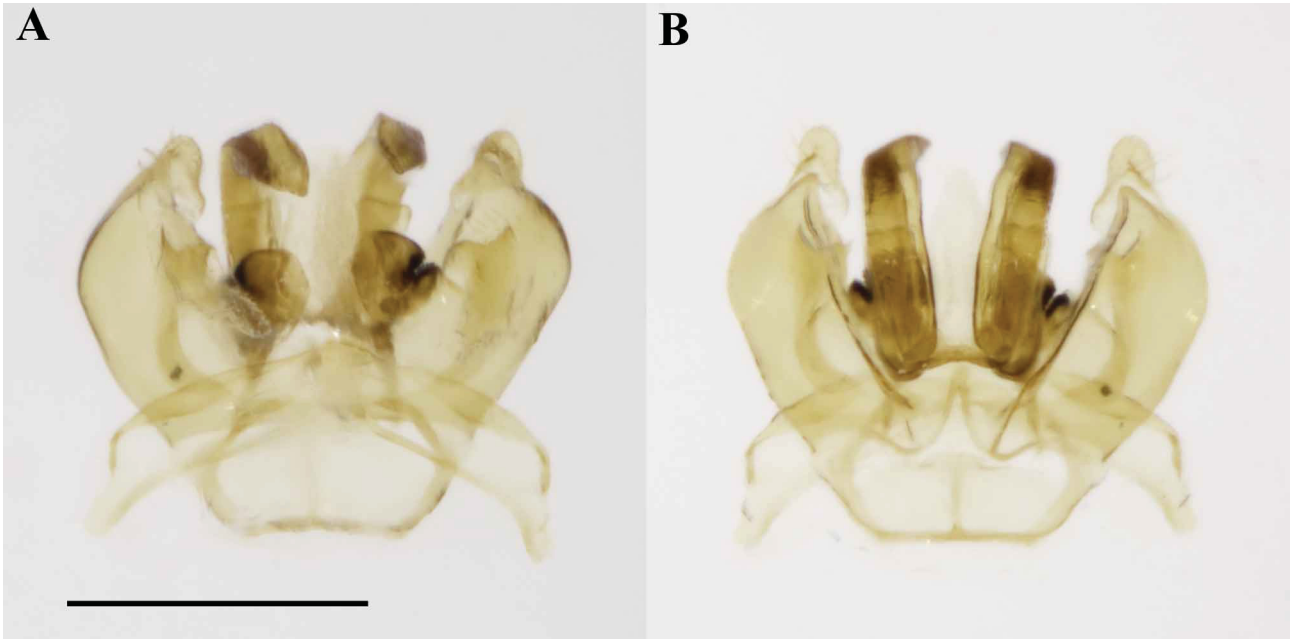

FIGURE 114. *Lasioglossum georgeickworti* Gibbs, new species male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

Range. Coastal regions of Massachusetts, PEI, south to Virginia (Fig. 115). **USA**: CT, DE, MA, NJ, NY, VA. **CANADA**: PE.

Allotype. USA: DELAWARE: 1♂ New Castle Co., N39.5445 W075.5761, 21.vi (S.W. Droege); [PCYU].

Paratypes. USA: CONNECTICUT: 1♀ Mansfield Twp., nr. Chapins Pond, 1.v.1973 (G.I. Stage); [AMNH]; MASSACHUSETTS: 4♀♀ Franklin Co., Montague WMA, gravel pit #4, N42.56862 W072.53409, 13–14.vi.2009 (J. Milam); 1♀ Franklin Co., Montague WMA, gravel pit #4, N42.56862 W072.53409, 18–19.vi.2010 (J. Milam); 7♀♀ Franklin Co., Montague WMA, gravel pit #4, N42.56862 W072.53409, 24–25.vi.2009 (J. Milam); 1♀ Franklin Co., Montague WMA, gravel pit #4, N42.56862 W072.53409, 5–6.vi.2009 (J. Milam); 5♀♀ Franklin Co., Montague WMA, large gravel pit, N42.56957 W072.53617, 22–23.vii.2010 (J. Milam); 1♀ Franklin Co., Montague WMA, large gravel pit, N42.56957 W072.53617, 29–30.vii.2008 (J. Milam); 1♀ Franklin Co., Montague WMA, gravel pit #3, N42.57277 W072.53865, 1–2.vii.2010 (J. Milam); 1♀ Franklin Co., Montague WMA, Pt. 44, scrub oak, N42.56701 W072.53274, 18–19.vi.2010 (J. Milam); 1♀ Plymouth Co., Halifax, Burrage Pond WMA, N42°0′44″ W080°52′23″, 11.vi.2010 (J. Milam); [CUIC]; 1♀ Middlesex Co., 0.5 mi S. of Townsend, sand pit, 5.viii.2006 (M.F. Veit); 3♀♀ Parker River NWR, N42.7719 W70.8057, 21–22.viii.2008 (D.B.); 1♀ Plymouth Co., Plymouth, Myles Standish St. Forest, 14.vii.2006 (M.F. Veit); [PCYU]; NEW JERSEY: 1♀ Burlington Co., Woodland Twp., S of Chatsworth, Franklin Parker Preserve, N38˚48.379′ W74˚32.655′, 12.vi.2007 (L.F. Henderson); [ANSP]; 1♀ Seaside Park "5–15" (Weiss & West); [CNC]; 1♀ Burlington Co., N39.4201 W74.6797, 22.vi.2010 (T. Harrison); [CUIC]; NEW YORK: 1♀ Nassau Co., Tobay Beach, 24–26.vi.1976 (G.C. Eickwort); 1♀ Nassau Co., Tobay Beach, in nest, 26.vi.1976 (G.C. Eickwort); 1♀ Nassau Co., Tobay Beach, 28.vii.1974 (G.C. Eickwort); [CUIC]; 1♀ Suffolk Co., 6.ix.2005 (S.W. Droege); 1♀ Suffolk Co., N40.99749 W072.0744, 7.ix.2005 (S.W. Droege); 1♀ Suffolk Co., N41.1279 W072.2716, 8.ix.2005 (S.W. Droege); [PCYU]; VIRGINIA: 1♀ Accomack Co., N37.9456 W75.3081, 10.viii.2008 (W. Schmitz); 1♀ Assateague I., N37.9808 W075.2808, 30.vi–1.vii.2006 (S.W. Droege); [PCYU].

Additional specimens examined. CANADA: PRINCE EDWARD ISLAND: 1♀ Queen's Co., Anderson Road, N46°24′37″ W062°53′45″, 14 m, 5.viii.2004 (S.K. Javorek); [ACNS].

Floral records. FABACEAE: *Baptisia*; SCROPHULARIACEAE: *Lindernia*.

Etymology. The specific epithet is named for the late George C. Eickwort for his studies of the Halictidae, including *Dialictus* nesting biology, socio-biology, and taxonomy.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon. *Lasioglossum georgeickworti* seems to be a specialist of coastal areas and dunes in the Northeast. A single female was collected on Prince Edward Island; with additional sampling it should be possible to find records from more New England states and eastern Canada.

FIGURE 115. Distribution map of *Lasioglossum georgeickworti* (stars) and *L. halophitum* (circles).

Lasioglossum (*Dialictus*) *gotham* Gibbs, new species
(Figures 116–119)

Holotype. ♀ USA, Maryland, Charles Co., N38.6861 W077.0791, 23–24.iv.2003 (S.W. Droege); [PCYU].

Diagnosis. Female *L. gotham* can be recognised by the following diagnostic combination: size large (6.1–7.1 mm); head wide (length/width ratio = 0.95–0.97) (Fig. 116B); mesoscutum polished, punctures sparse between parapsidal lines (Fig. 117); mesepisternum rugulose, obscurely punctate; T1 acarinarial fan with narrow dorsal opening (Fig. 117); and metasomal terga brown, punctate on apical impressed areas. They are most similar to *L. laevissimum* and *L. smilacinae*. Female *L. laevissimum* have apical halves of metasomal terga impunctate. Female *L. smilacinae* have the mesosoma dull and blue, and T1 acarinarial fan complete dorsally.

FIGURE 116. *Lasioglossum gotham* Gibbs female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Males of *L. gotham* are similar to females and may be further distinguished by head moderately wide (length/width ratio = 0.97); face below eye emargination with relatively dense tomentum obscuring surface (Fig. 118B); flagellomeres elongate (length/width ratio = 1.86–2.00); mesoscutum polished, punctation sparse (i=1–5d), fine (Fig. 119); mesepisternal punctures present; metasomal terga brown, without tomentum, and apical impressed areas impunctate except for narrow band of moderately dense punctures anteriorly. They are most similar to *L. zephyrum* and *L. smilacinae*. Male *L. zephyrum* have the metapostnotal posterior margin rounded and greenish reflections on the metasomal terga. Male *L. smilacinae* have only widely scattered punctation on apical impressed areas of metasomal terga.

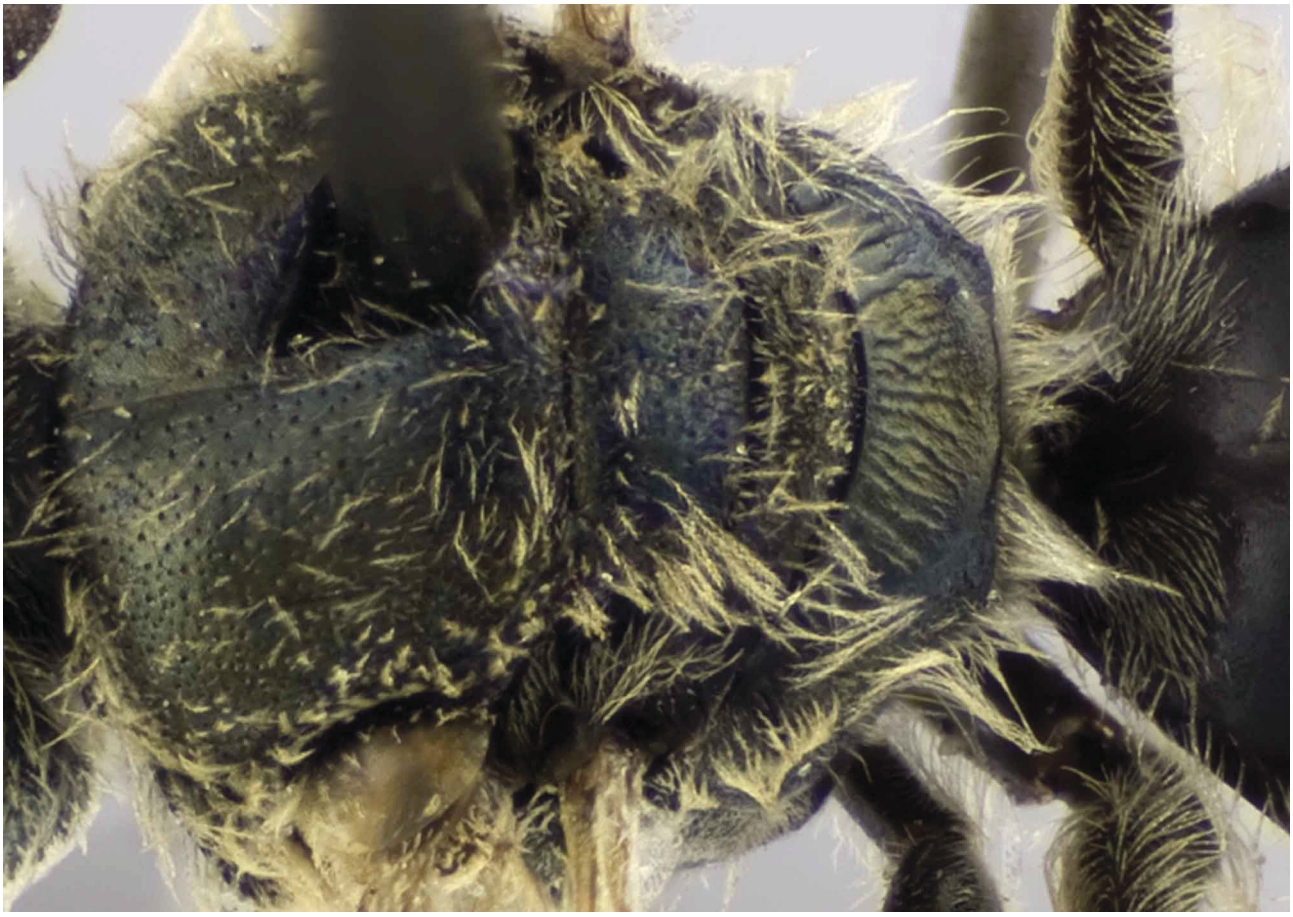

FIGURE 117. *Lasioglossum gotham* Gibbs female, dorsal view of mesosoma.

Description. FEMALE. Length 6.05–7.08 mm. head length 1.66–1.78 mm. head width 1.73–1.87 mm. forewing length 4.84–5.20 mm.

Colouration. Head and mesosoma pale green with bluish reflections, especially on head. Clypeus with apical half blackish brown and basal half, and supraclypeal area golden. Antenna dark brown, F8–F10 with ventral surface reddish brown to brownish yellow. Tegula amber. Wing membrane subhyaline, venation and pterostigma amber. Legs brown, except tarsi reddish brown. Metasoma blackish brown, terga and sterna with apical margins reddish brown.

Pubescence. Dull white. Mostly sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena with sparse subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga moderately sparse, fine hairs. T1 acarinarial fan with narrow dorsal opening. T2–T3 basolaterally with dense tomentum obscuring surface. T4–T5 with scattered tomentum across disc, not obscuring surface. T2–T4 apicolateral margins with very sparse apical fringe.

Surface sculpture. Face weakly imbricate, punctation moderately coarse. Clypeus polished, punctation sparse (i=1–2.5d). Supraclypeal area with punctation moderately dense (i=1–1.5d). Lower paraocular area punctation dense (i≤d). Antennocular area punctation moderately dense (i<1.5d). Upper paraocular area and frons reticulate-punctate. Ocellocular area minutely punctate (i≤d). Gena weakly lineolate. Postgena imbricate. Mesoscutum polished, weakly imbricate medially, punctation moderately sparse between parapsidal lines (i=1–2d), dense mesad and laterad of parapsidal line (i≤d), contiguous on anterolateral portion. Mesoscutellum polished, submedial punctation moderately sparse (i=1–2d). Axilla punctate. Metanotum rugulose-reticulate. Preëpisternum rugulose. Hypoepimeral area reticulate. Mesepisternum dorsal half rugulose, ventral half imbricate, with obscure punctures (i=1–1.5d). Metepisternum with dorsal half rugosocarinulate, ventral half imbricate. Metapostnotum longitudinally carinulate, not reaching posterior margin, plicate laterally. Propodeum with dorsolateral slope rugulose, lateral and posterior surfaces tessellate-imbricate. Metasomal terga weakly coriarious, punctation on basal halves moderately dense (i=1–2d), sparse on apical halves (i=2–4d).

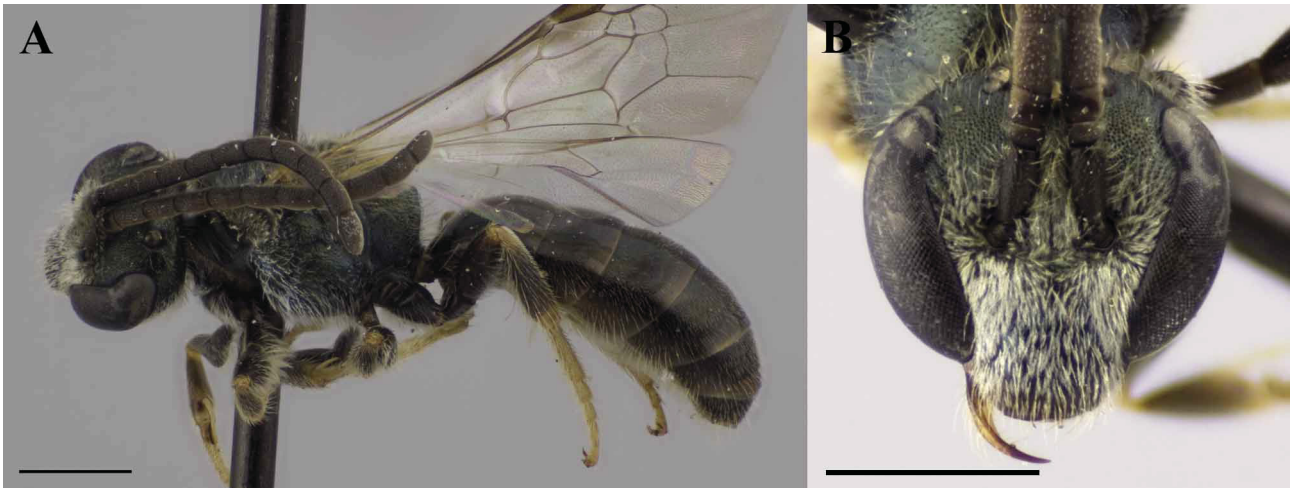

FIGURE 118. *Lasioglossum gotham* Gibbs male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Structure. Head wide (length/width ratio = 0.95–0.97). Eyes convergent below (UOD/LOD ratio = 1.13–1.14). Clypeus 1/2–2/3 below suborbital tangent, apicolateral margins convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2 OD below median ocellus. Gena width subequal to eye. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum moderately elongate (MMR ratio = 1.14–1.25), posterior margin rounded onto posterior surface. Propodeum with oblique carina moderately strong, lateral carina moderately strong, reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 5.26 mm; head length 1.56 mm; head width 1.61 mm; forewing length 4.54 mm.

Colouration. Head and mesosoma pale blue. Flagellum with ventral surface brownish yellow. Pterostigma reddish brown. Legs brown, except tibial bases and apices, and tarsi brownish yellow.

Pubescence. Face below eye emargination with moderately dense tomentum, partially obscuring surface, densest on lower paraocular area. Gena with virtually no tomentum. Metasomal terga without tomentum. S3 and S4–S5 apicolateral portions with dense plumose hairs (1–1.5 OD).

Surface sculpture. Punctation fine. Clypeal punctation moderately dense (i=1–2d). Mesoscutal punctation sparse between parapsidal lines (i=1–5d). Mesoscutellar punctures sparse (i=1–2.5d). Hypoepimeral area imbricate, obscurely punctate. Mesepisternum with dorsal portion ruguloso-punctate and ventral portion distinctly punctate (i=1–2d). Metapostnotum coarsely rugoso-carinulate, reaching posterior margin. Metasomal terga polished, punctation distinct throughout (i=1–2d), except apical portion of the apical impressed areas impunctate.

Structure. Head moderately wide (length/width ratio = 0.97). Eyes strongly convergent below (UOD/LOD ratio = 1.49). Clypeus 2/3 below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets distant (IAD/OAD > 1.4). Frontal line carinate, ending 1.5 OD below median ocellus. Pedicel shorter than F1. F2 length 2.0X F1. F2–F10 elongate (length/width ratio = 1.86–2.00). Metapostnotum moderately elongate (MMR ratio = 1.15), posterior margin narrowly rounded onto posterior surface.

Terminalia. S7 with median lobe clavate, nearly parallel-sided. S8 with apicomedial margin weakly convex. Genital capsule similar to *L. smilacinae* (see Gibbs 2010b). Gonobase with ventral arms widely separated. Volsella roughly ovoid. Gonostylus short. Retrorse lobe elongate, attenuated apically.

FIGURE 119. *Lasioglossum gotham* Gibbs male, dorsal view of mesosoma.

Range. Pennsylvania to Georgia (Fig. 120). **USA**: GA, MD, NC, NY, PA, SC, VA.

Allotype. ♂ USA, Maryland, Garrett Co., N39.94722 W078.55, 7.vii.2008 (J. Whittaker); [PCYU].

Paratypes. USA: GEORGIA: 1♀ Atlanta, 5.iii.1938 (P.W. Fattig); 1♀ Atlanta, 31.iii.1940 (P.W. Fattig); 1♀ Atlanta, 18.vi.1941 (P.W. Fattig); 1♂ Atlanta, 19.vi.1941 (P.W. Fattig);2♀♀ Atlanta, 5.iii.1944 (P.W. Fattig); 1♀ Atlanta, 11.iii.1945 (P.W. Fattig); 1♀ Dallas, 11.iii.1945 (P.W. Fattig); [NCSU]; MARYLAND: 1♀ Beltsville 27.ii.1976 (S.W.T. Batra); 4♀♀ Beltsville, 1.iv.1975 (S.W.T. Batra); 7♂♂ Beltsville, 23.vi.1976 (S.W.T. Batra); [CUIC]; 1♀ Pr. George's Co., N38.9002 W076.674, 20.iv.2002 (S.W. Droege); [PCYU]; NEW YORK: 1♀ Bronx Botanical Garden, 11.v.1971 (J. Lin); 2♀♀ Kings Co., Brooklyn Botanical Garden, 18.vii.2009 (J.S. Ascher); [AMNH]; NORTH CAROLINA: 1♀ Black Mts., 1911 "Ac. 33827"; [AMNH]; 1♀ Grandfather Mountain, 24.vi.1954 (T.B. Mitchell); 1♀ Raleigh, 15.v.1961 (T.B. Mitchell); 1♀ Raleigh, 10.iv.1951 (T.B. Mitchell); 3♀♀ Raleigh, 1.iv.1951 (E.G. Cummings); 1♀ Sylva, 22.vi.1952 (W.A. Stephen); 1♀ Willard, 6.iv.1951 (T.B. Mitchell); [NCSU]; PENNSYLVANIA: 2♀♀ Huntingdon Co., Meadow Gap,

21.vi.2005 (V. Giles); [AMNH]; 1♀ Bucks Co., N40.4 W074.83, 5.viii.2007 (J. Stager); [PCYU]; SOUTH CAROLINA: 1♀ Anderson Co., Pendleton, 250 m, Mat. Hardwood Forest, 17– 24.vi.1987 (BRC Hym. Team); 1♀ Dorchester Co., Francis Beidler For., 10 km NE Harleyville, Bald Cypress Swamp, v–vi.1987; [CNC]; VIRGINIA: 4♀♀ Shenandoah N.P., Big Meadow, 1300 m, natural meadow, vi–6.vii.1987 (BRC Hym. Team); 1♂ Warren Co., Shenandoah N.P., Compton Gap, 800 m, 5.vi–2.vii.1987 (BRC Hym. Team); [CNC]; 1♀ Arlington, 15.iv.1951 (K.V. Krombein); [NCSU].

Floral records. ACERACEAE: *Acer rubrum*; BORAGINACEAE: *Mertensia virginica*; CARYOPHYLLACEAE: *Stellaria media*; FABACEAE: *Trifolium* sp.; GERANIACEAE: *Geranium molle*; LAMIACEAE: *Lamium amplexicaule*; RHAMNACEAE: *Ceanothus*; ROSACEAE: *Craetagus*, *Prunus*; VIOLACEAE: *Viola bicolor.*

Biology. Detailed studies of *L. gotham* phenology, nesting biology, socio-biology, floral hosts, and natural enemies was provided by Batra (1987; as *D. laevissimus*).

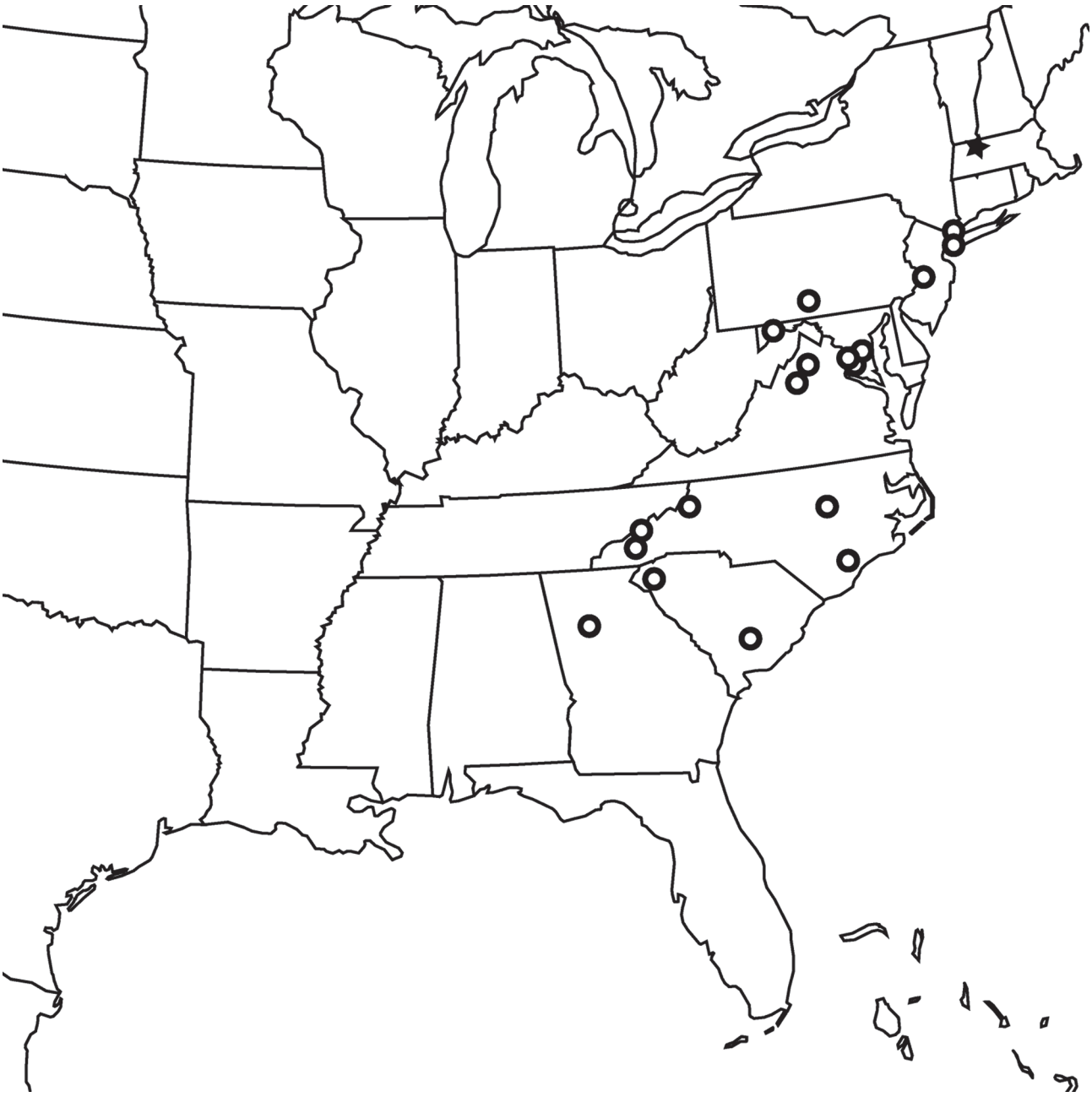

FIGURE 120. Distribution map of *Lasioglossum furunculum* (star) and *L. gotham* (circles).

Etymology. The specific epithet is named for the city of New York where some of the paratypes were collected.
DNA barcode. Available. Multiple sequences.
Comments. Uncommon.

***Lasioglossum* (*Dialictus*) *halophitum* (Graenicher)**
(Figures 121–125)

Halictus (*Chloralictus*) *halophitus* Graenicher, 1927: 206. ♀♂.

Holotype. ♀ USA, Florida, Cutler, south of Miami, 5.v.1923 (S. Graenicher); [NMNH]. Examined.

Halictus halophilus Graenicher, 1930: 156. (Emend.)

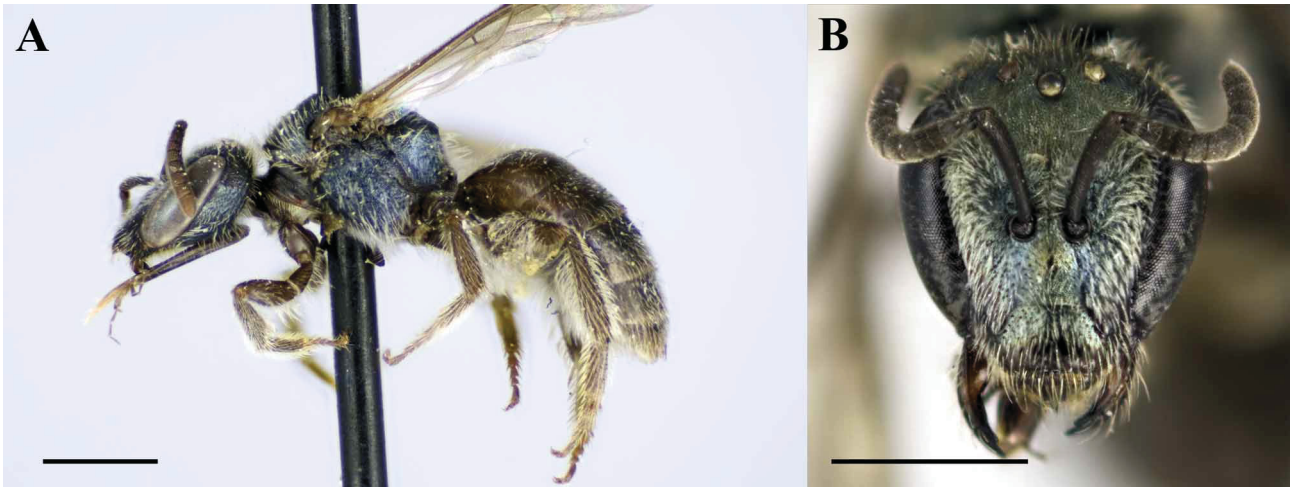

FIGURE 121. *Lasioglossum halophitum* (Graenicher) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 122. *Lasioglossum halophitum* (Graenicher) female, dorsal view of mesosoma.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *halophitum*, p. 1113 (catalogue); Mitchell, 1960: *Dialictus halophitus*, p. (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *halophitum*, p. 463 (catalogue); Moure and Hurd, 1987: *Dialictus halophitus*, p. 102 (catalogue).

Diagnosis. Female *L. halophitum* can be recognised by the following diagnostic combination: head elongate (length/width ratio = 1.06–1.08) (Fig. 121B); mesoscutal punctures sparse between parapsidal lines (Fig. 122); metapostnotal rugae very fine, medially obscure among tessellate background (Fig. 122).They are most similar to *L. creberrimum* and *L. tamiamense*, which both have dense mesoscutal punctures.

Male *L. halophitum* can be recognised by the following diagnostic combination: head elongate (length/width ratio = 1.09–1.12) (Fig. 123B); eyes weakly convergent below (Fig. 123B), mesoscutal punctures sparse between parapsidal lines (Fig. 124), and metapostnotal rugae fine. They are most similar to male *L. creberrimum* and *L. tamiamense*, which both have dense mesoscutal punctures.

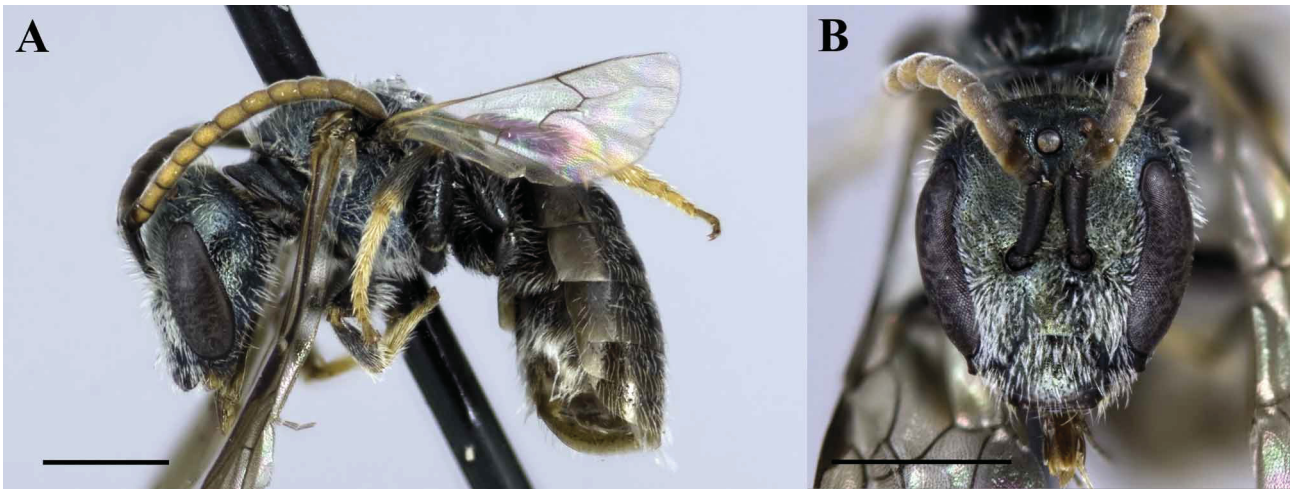

FIGURE 123. *Lasioglossum halophitum* (Graenicher) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 124. *Lasioglossum halophitum* (Graenicher) male, dorsal view of mesosoma.

Redescription. FEMALE. Length 5.14–5.75 mm; head length 1.58–1.85 mm; head width 1.49–1.70 mm; forewing length 3.63–4.24 mm.

Colouration. Head and mesosoma pale green to bluish green. Clypeus with apical half blackish brown. Supraclypeal area bronze. Antenna dark brown, flagellum with ventral surface brownish orange. Tegula reddish to brown. Wings

faintly dusky, venation and pterostigma yellowish brown. Legs brown, except medio- and distitarsi reddish brown. Metasomal terga and sterna brown, apical margins pale, translucent yellow.

Pubescence. Dull white. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena with sparse subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately dense, fine hairs. T1 acarinarial fan sparse, interspersed with erect hairs, incomplete due to large dorsal opening. T2–T3 laterally and T4–T5 with sparse tomentum not obscuring surface. T2–T4 apical margins with moderately sparse fringes.

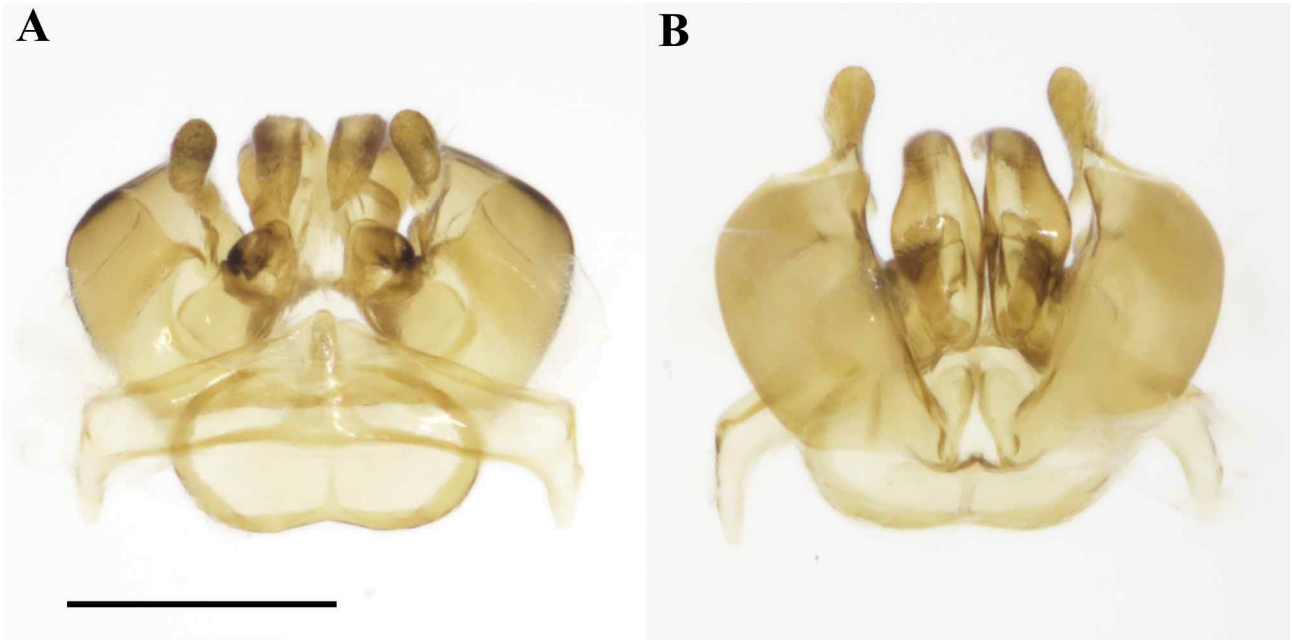

FIGURE 125. *Lasioglossum halophitum* (Graenicher) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

Surface sculpture. Face imbricate, punctation fine. Clypeus punctation (i=1–2.5d). Supraclypeal area with punctation moderately dense (i=1–1.5d). Lower paraocular and antennocular areas with punctation dense (i≤d). Upper paraocular area and frons punctate-reticulate. Ocellocular area punctate (i≤d). Gena and postgena lineolate. Mesoscutum imbricate, punctation sparse on most of disc (i=1–3d), densely punctate mesad and laterad of parapsidal line and on anterolateral portion (i≤d). Mesoscutellum weakly imbricate, submedial punctation very sparse (i=1–6d). Axilla punctate. Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area rugulose-imbricate. Mesepisternum rugulose. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum weakly rugoso-carinulate, posterior margin tessellate-imbricate. Propodeum with dorsolateral slope carinulate, lateral surface ruguloso-imbricate, posterior surface tessellate. Metasomal terga weakly coriarious, punctation moderately dense throughout (i=1–1.5d).

Structure. Head elongate (length/width ratio = 1.06–1.08). Eyes convergent below (UOD/LOD ratio = 1.18–1.26). Clypeus ½ below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–5 branches. Metapostnotum truncate (MMR ratio = 1.45–1.47), posterior margin weakly rounded onto posterior surface. Propodeum with oblique carina fine, lateral carina weak, nearly reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 4.96–5.20 mm; head length 1.67–1.85 mm; head width 1.54–1.66 mm; forewing length 3.63 mm.

Colouration. Labrum and mandible brownish yellow. Flagellum with ventral surface reddish. Legs brown, except tibial bases and apices and tarsi brownish yellow.

Pubescence. Paraocular area below eye emargination with tomentum obscuring surface. S3 and S4 laterally with dense plumose hairs (1–2 OD).

Surface sculpture. Clypeal punctation moderately dense (i=1–2d). Metasomal terga punctation dense except apical impressed areas nearly impunctate, with only a few scattered punctures.

Structure. Head very elongate (length/width ratio = 1.09–1.12). Eyes convergent below (UOD/LOD ratio = 1.22–1.25). Clypeus 2/3 below suborbital tangent, apicolateral margins convergent. Antennal sockets distant (IAD/OAD >

0.6). Frontal line carinate, ending 2OD below median ocellus. Pedicel shorter than F1. F2 length 1.5–1.7X F1. F2–F10 moderately elongate (length/width ratio = 1.43–1.67). Metapostnotum short (MMR ratio = 1.52–1.58), posterior margin rounded onto posterior surface.

Terminalia. S7 with median lobe acuminate (Fig. 125). S8 with apicomedial margin weakly convex (Fig. 125). Genital capsule as in Fig. 125. Gonobase with ventral arms widely separated. Volsella roughly ovoid. Gonostylus elongate, dorsal setae elongate. Retrorse lobe elongate, strongly attenuated apically.

Range. Maryland, south to Caribbean Islands (Fig. 115). **BAHAMAS**. **CUBA. JAMAICA**. **USA**: FL, GA, LA, MD, NC, SC, VA.

Additional specimens examined. BAHAMAS: 1♀ San Salvador Island, 18.vi.1978 (N. Elliot); [CUIC]. **JAMAICA:** 8♀♀Trelawny Parish, salt marsh, 9.viii.1985 (G.C. Eickwort); [CUIC]; **USA:** FLORIDA: 1♀ Tahiti Beach, 22.v.1927 (S. Graenicher); 1♀1♂ Tahiti Beach, 12.vi.1927 (S. Graenicher); 1♀ Tahiti Beach, 28.viii.1927 (S. Graenicher); [NCSU]; 1♀ *paratype* Cutler, 20.v.1923 (S. Graenicher); 1♂ *paratype* Cutler, 20.iv.1923 (S. Graenicher); [NMNH]; 1♀ *paratype* Cutler, 20.v.1923 (S. Graenicher); 1♂ *paratype* Cutler, 20.iv.1923 (S. Graenicher); 1♂ Dade Co., Everglades N.P., 15.iii.1955 (H.A. Denmark); 1 ♀ Flamingo, 13.iv.1923; [CUIC]; 3♀♀2♂♂ Monroe Co., Knight's Key, 2.viii.1984 (L. Packer); 1♀ Homestead, Miami, 30.viii.2006 (J.A. Genaro); [PCYU]; GEORGIA: 1♀ Bryan Co., Richmond Hill S.P., 2.v.1974 (G.C. Eickwort); 1♀ Tybee Island, 26.vii.1913; [CUIC]; LOUSIANA: 1♀ Acadia P., Jct. Hwy 92-Hwy 90, 26.v.1996 (S. Johnson); [INHS]; MARYLAND: 2♀♀ Dorchester Co., N38.3814 W076.0677, 21.viii.2003, 2♀♀ Somerset Co., N37.9 W075.7, 8.v.2002 (S.W. Droege); [PCYU]; NORTH CAROLINA: 2♀♀ Hyde Co., N35.4164 W076.1625, 7.vi.2005 (S.W. Droege); [PCYU]; SOUTH CAROLINA: 1♂ Georgetown Co., 6 mi. SSW of Murrells Inlet, 28.v.1937 (R. Dow); [NMNH]; VIRGINIA: 2♀♀ Assateague I., N37.9576 W075.3147, 30.vi–1.vii.2006 (S.W. Droege); 1♂ Assateague I., N37.9804 W075.2926, 30.vi–1.vii.2006 (S.W. Droege); 4♀♀ Assateague I., N37.9124 W075.359, 1–2.vii.2006 (S.W. Droege); 1♀ Accomack Co., N37.9695 W075.3043, 30.vi–1.vii.2006 (S.W. Droege); [PCYU].

Floral records. AIZOACEAE: *Sesuvium maritimum*, *S. portulacastrum*; AMARANTHACEAE: *Achyranthes "mercanthifolia"*; ASTERACEAE: *Anthemis*, *Baccharis*, *Borrichia*, *Cirsium*, *Eupatorium*, *Mikania*; BORAGINACEAE: *Heliotropium*; EUPHORBIACEAE: *Chamaesyce mesembrianthemifolia*, *Euphorbia*; PORTULACEAE: *Portulaca*; SCROPHULARIACEAE: *Bacopa monniera*; SURIANACEAE: *Suriana*.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon. *Lasioglossum halophitum*, as its name suggests, has a preference for salt marshes.

Lasioglossum (*Dialictus*) *hartii* (Robertson)

(Figures 126–130)

Halictus hartii Robertson, 1892: 268. ♀.

Holotype. ♀ USA, Illinois [INHS: Hart #17211]. Lost (Webb 1980).

Halictus rugosus Crawford, 1902a: 237. ♀ ♂.

Holotype. ♀ USA, Nebraska, Nebraska City,, 12.ix.1901, on *Solidago* (M.A. Carriker); [NMNH: 8233]. Examined.

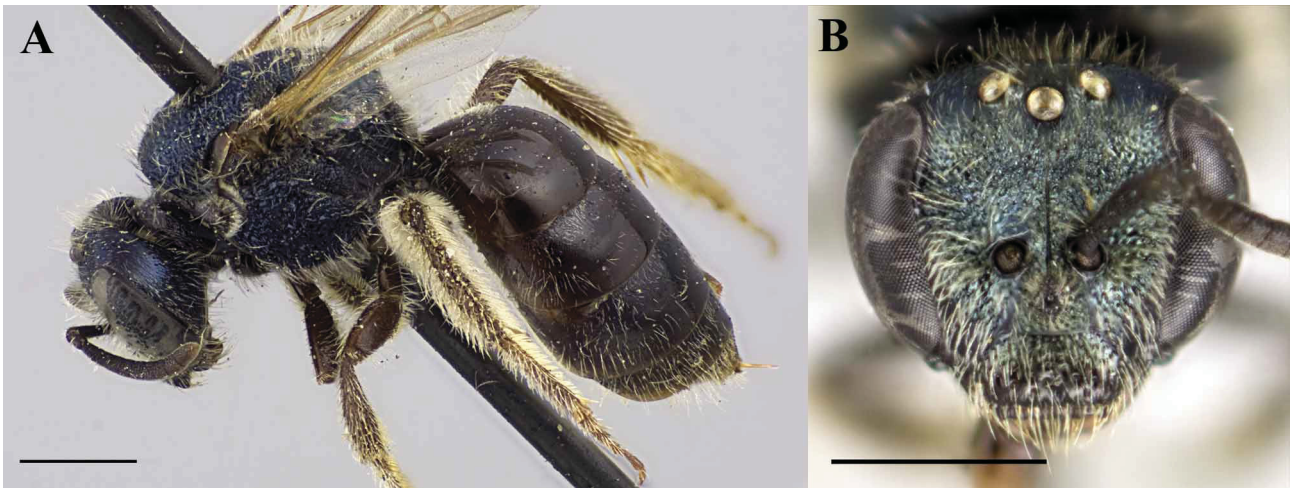

FIGURE 126. *Lasioglossum hartii* (Robertson) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 127. *Lasioglossum hartii* (Robertson) female, dorsal view of mesosoma.

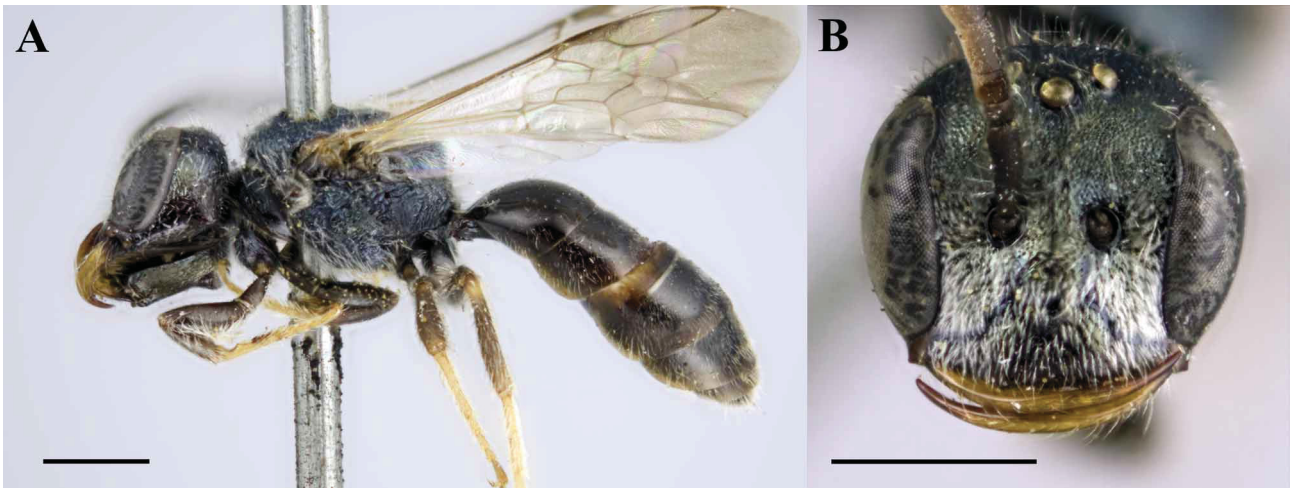

FIGURE 128. *Lasioglossum hartii* (Robertson) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *hartii*, p. 1114 (catalogue); Mitchell, 1960: *Dialictus hartii* ♀♂, p. 396 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *hartii*, p. 463 (catalogue); Moure and Hurd, 1987: *Dialictus hartii*, p. 102 (catalogue).

Diagnosis. Both sexes of *L. hartii* can be recognised by the following diagnostic combination: mesoscutum coarsely rugose, punctures distinct only medially (Figs. 127, 129) and pronotal ridge carinate. Male *L. hartii* often can be further distinguished by gena with strong tubercle and mandible elongate, extending to opposing mandibular base (Fig. 128B).

Redescription. FEMALE. Length 6.05–6.29 mm; head length 1.58–1.85 mm; head width 1.82–2.03 mm; forewing length 4.30–4.66 mm.

FIGURE 129. *Lasioglossum hartii* (Robertson) male, dorsal view of mesosoma.

Colouration. Head and mesosoma blue, with greenish reflections. Clypeus with apical half blackish brown, basal half and supraclypeal area bronze. Antenna blackish brown, flagellum with ventral surface dark reddish brown. Tegula dark reddish brown. Wing membrane faintly dusky, venation and pterostigma amber. Legs brown, except tarsi reddish brown. Metasoma blackish brown, terga and sterna with apical margins reddish.

Pubescence. Dull to yellowish white. Relatively sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area with sparse subappressed hairs. Gena without tomentum. Propodeum with dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with sparse, fine hairs. T1 acarinarial fan with dorsal opening. T2–T3 with at most sparse tomentum basolaterally. T2 apicolateral and T3–T4 apical margins without fringes.

Surface sculpture. Face weakly imbricate, punctation coarse. Clypeus polished, basal margin imbricate, punctation dense (i≤d). Supraclypeal area with punctation dense (i≤d). Lower paraocular with punctation moderately dense (i≤d). Antennocular area reticulate. Upper paraocular area and frons rugulose. Ocellocular area polished, finely punctate (i=1–1.5d). Gena carinulate and postgena imbricate. Mesoscutum coarsely rugose imbricate, punctation separated only medially (i≤d). Mesoscutellum similar to mesoscutum, submedial punctation moderately dense (i=1–1.5d). Axilla punctate. Metanotum rugulose. Preëpisternum, hypoepimeral area, mesepisternum, and metepisternum strongly rugose. Metapostnotum rugoso-carinulate with broad polished areas between rugae. Propodeum strongly rugose, except posterior surface rugulose-imbricate. Metasomal terga polished except marginal areas faintly coriarious, punctation very fine dense (i=1.5–2.5d), apical margins narrowly impunctate.

Structure. Head very wide (length/width ratio = 0.87–0.89). Eyes weakly convergent below (UOD/LOD ratio = 1.09–1.15). Clypeus 2/3 below suborbital line, apicolateral margins convergent. Supraclypeal area strongly protuberant. Antennal sockets close (IAD/OAD < 0.6). Frontal line carinate, ending <2 OD below median ocellus. Gena narrower than eye. Pronotal ridge carinate, interrupted by oblique sulcus. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum posterior margin sharply angled, nearly carinate. Metapostnotum moderately truncate

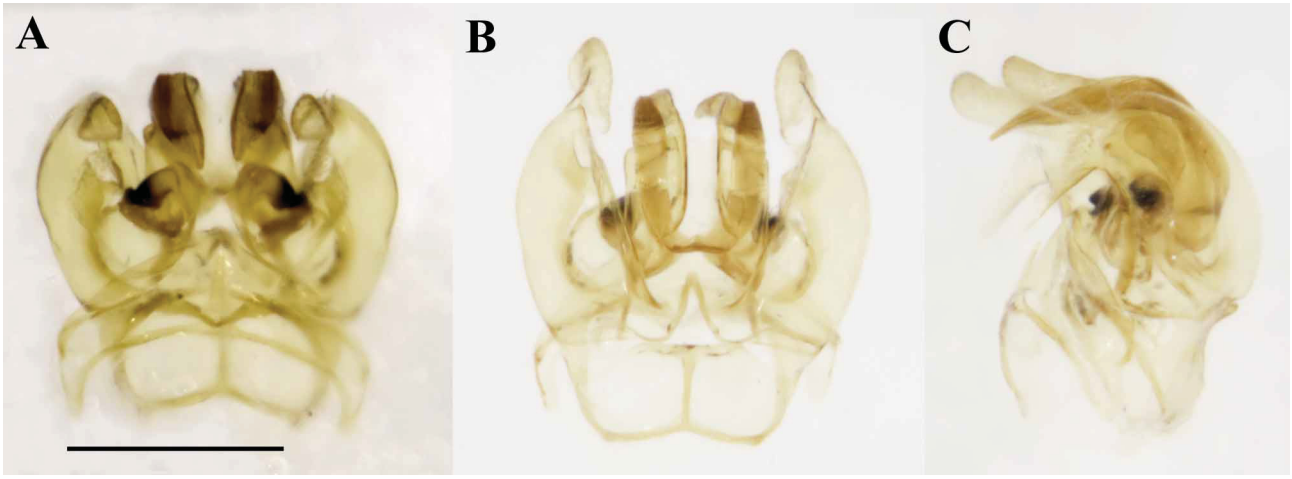

FIGURE 130. *Lasioglossum hartii* (Robertson) male terminalia, (A) ventral view, (B) dorsal view, (C) lateral view. Scale bar = 0.5 mm.

(MMR ratio = 1.31–1.43), posterior margin carinate. Propodeum with oblique carina very strong, lateral carina strong reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length. 5.63–6.11 mm; head length 1.44–1.70 mm; head width 1.61–1.92 mm; forewing length 3.81–4.36 mm.

Colouration. Mandible yellow. Flagellomere with ventral surface orange-yellow. Legs brown, except tarsi yellowish brown.

Pubescence. Lower paraocular area with dense tomentum. Face below antennal sockets otherwise with sparse subappressed tomentum, partially obscuring surface. S4 apicolateral and S4 lateral portions with posteriorly directed tufts (i=1.5–2 OD).

Surface sculpture. Mesoscutal punctures more distinct between parapsidal lines (i=1–1.5d).

Structure. Head wide (length/width ratio = 0.89–90). Eyes weakly convergent below (UOD/LOD ratio = 1.07–1.17). Mandible elongate, nearly reaching opposing mandible base. Clypeus 1/2 below suborbital line, apicolateral margins subparallel. Antennal sockets distant (IAD/OAD > 1.0). Frontal line carinate, ending 1.5 OD below median ocellus. Pedicel shorter than F1. F2 length 1.4–1.7X F1. F2–F10 elongate (length/width ratio = 1.57–1.64). Gena often with large triangular tubercle. Pronotal dorsolateral angles acute. Pronotal ridge carinate, uninterrupted. Metapostnotum moderately truncate (MMR ratio = 1.27–1.35), posterior margin sharply angled onto posterior surface. Propodeum with less evident oblique and lateral carinae.

Terminalia. S7 with median lobe very narrow, acuminate (Fig. 130). S8 with apicomedial margin strongly convex (Fig. 130). Genital capsule as shown in Fig. 130. Gonobase with ventral arms narrowly separated. Volsella roughly ovoid. Gonostylus elongate, dorsal setae elongate. Retrorse lobe elongate, attenuated apically.

Range. Minnesota, south to Alabama, Texas (Fig. 82). **USA**: AL, AR, IL, LA, MI, MN, MO, NC, TX.

Additional material examined. USA: ALABAMA: 1♀ Decatur, viii.1944 (G.E. Bohart) [BBSL]; ARKANSAS: 1♀ Clinton Co., 10 mi NE Dewitt, 27.viii.1967 (D.P. Gregory); [CUIC]; IOWA: 1♀ Louisa Co., Columbus Junction; [CUIC]; LOUSIANA: 2♀♀ Tallulah, iv. [NMNH]; MICHIGAN: 1♀ Saginaw Co., N43.34275 W84.10839, 25.vi.2009, (Tuell *et al*.); [PCYU]; MINNESOTA: 1♀ Houston Co., 21.v.1938 (P. Nicholson); [NCSU]; MISSOURI: 1♀ Lincoln Co., NE Elseberry on Mississippi, 26.viii.2001 (Arduser); 1♀ Perniscot Co., 4 mi S of Portageville, 25.ix.2004 (Arduser); [PCYU]; NEBRASKA: 1♀ (*H. rugosus* paratype) Nebraska City, 19.v.1901 (M.A. Carriker); 1♂ (*H. rugosus* paratype) Nebraska City, 12.ix.1901 (M.A. Carriker); [NMNH]; NORTH CAROLINA: 2♀♀1♂ Hyde Co., 28.v.1957 (T.B. Mitchell); [CUIC]; 1♀1♂ Hyde Co., 27.v.1957 (T.B. Mitchell); 1♀24♂♂ Hyde Co., 28.v.1957 (T.B. Mitchell); [NCSU]; TEXAS: 1♀2♂♂ Liberty, 22.vi.1917 (C.U. Expedit.); [CUIC].

Floral records. ASTERACEAE: *Anthemis*, *Erigeron*, *Solidago*, *Vernonia*; BRASSICACEAE: *Capsella*, *Rorippa*; CLUSIACEAE: *Hypericum*; FABAEAE: *Vicia*; ONAGRACEAE: *Gaura longiflora*; ROSACEAE: *Rubus*.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon. *Lasioglossum hartii* is widely distributed in the eastern United States but uncommonly collected. This species has a preference for wetland areas (M. Arduser, *in litt*.).

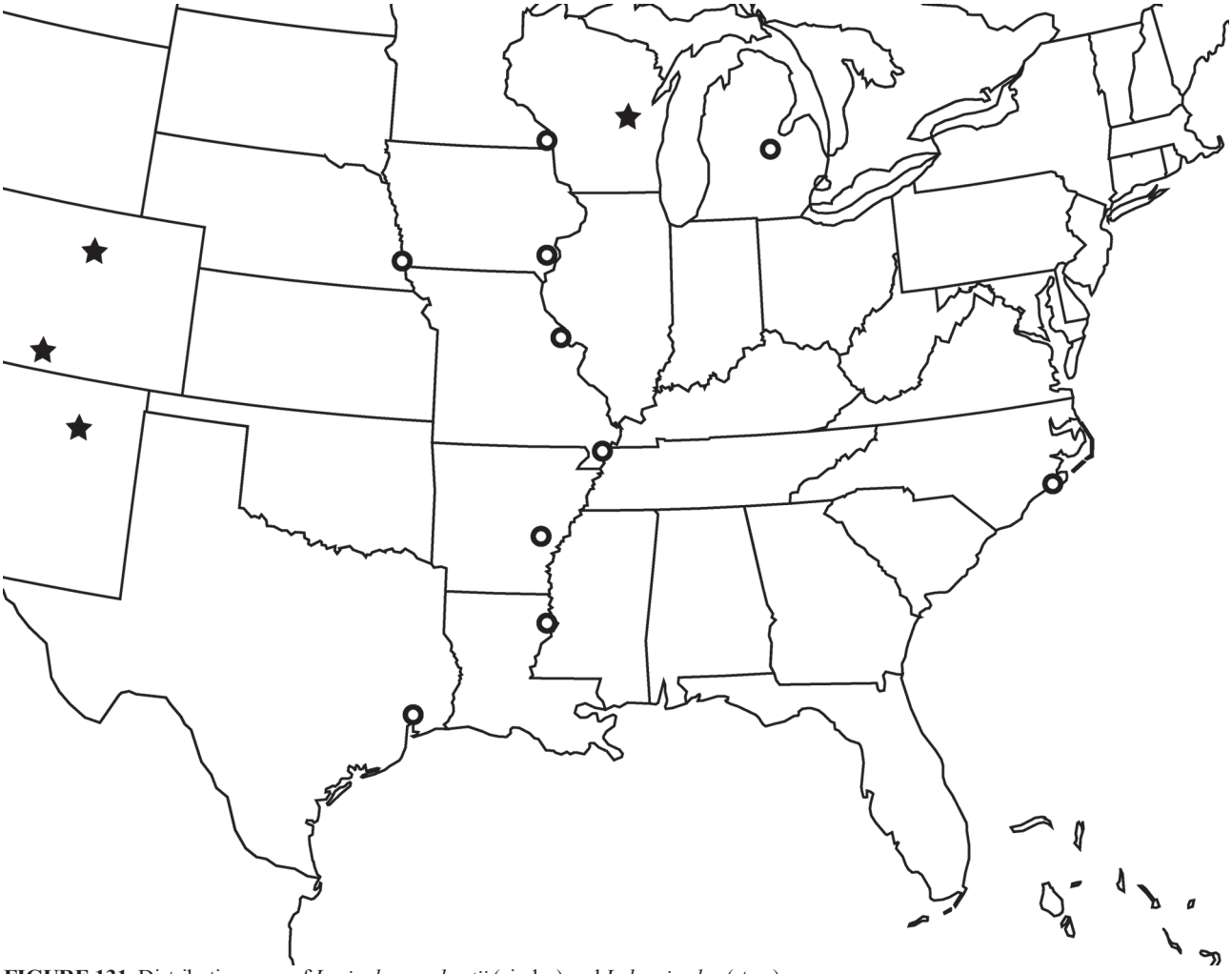

FIGURE 131. Distribution map of *Lasioglossum hartii* (circles) and *L. hemimelas* (stars).

Lasioglossum (*Dialictus*) *hemimelas* (Cockerell)

(Figures 132, 133)

Halictus hemimelas Cockerell, 1901: 285. ♀.

Holotype. ♀ USA, [New Mexico], top of the Las Vegas range, 29.vi.1901, (Cockerell); [NMNH: 12073].

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *hemimelas*, p. 1114 (catalogue); Moure and Hurd, 1987: *Dialictus hemimelas*, p. 103 (catalogue).

Diagnosis. Female *L. hemimelas* can be recognised by the following diagnostic combination: T1 anterior surface with evenly distributed erect hairs but acarinarial fan completely absent (Fig. 133), metapostnotal rugae nearly reaching posterior margin (Fig. 133), and T2 apical impressed area impunctate. They are most similar to *L. versans* and *L. ruidosense* (Cockerell), both of which have the metapostnotal rugae short not reaching more than 2/3 distance to posterior margin.

Male unknown.

Redescription. FEMALE. Length 5.80–6.16 mm; head length 1.80 mm; head width 1.66 mm; forewing length 4.21–4.27 mm.

Colouration. Head and mesosoma faintly bluish green, nearly brown on parts of face and propodeum. Clypeus with apical half blackish brown, basal half, and supraclypeal area bronze. Antenna dark brown, flagellum with ventral surface brown to reddish brown. Tegula dark reddish brown. Wing membrane subhyaline, venation and pterostigma reddish brown. Legs dark brown, medio- and distitarsi reddish brown. Metasoma dark brown, terga and sterna with marginal areas reddish brown.

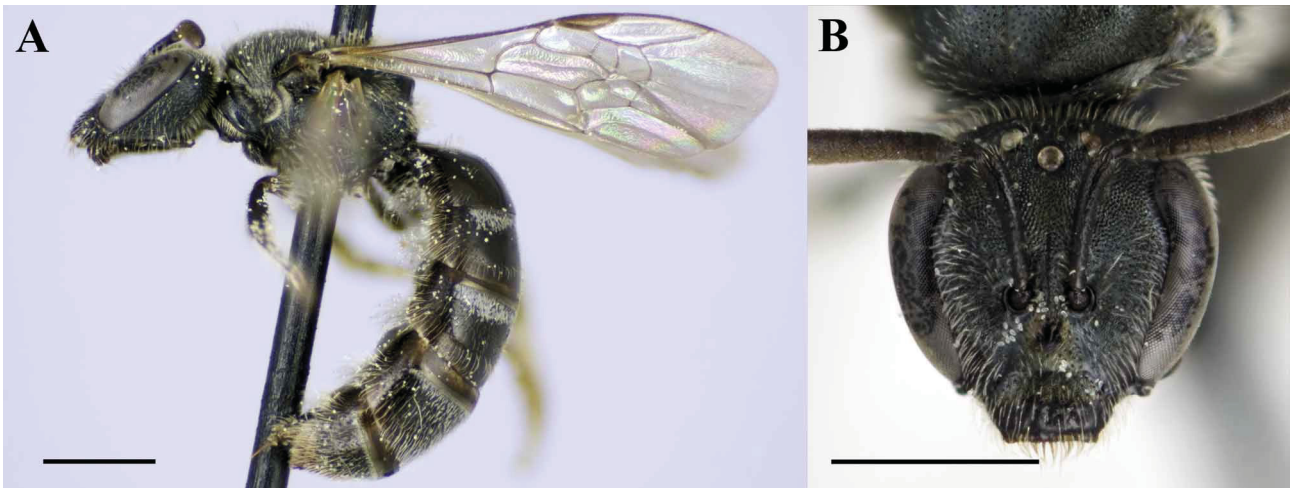

FIGURE 132. *Lasioglossum hemimelas* (Cockerell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Pubescence. Dull white. Sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Lower paraocular area and gena without subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (1.5–2 OD). Metasomal terga with sparse, fine hairs. T1 acarinarial fan absent, declivitous surface with sparse, erect hairs (1.5 OD). T2–T4 with dense tomentum basolaterally. T4 apical margins with very sparse fringe.

Surface sculpture. Face imbricate, punctation fine. Clypeus with apical half polished, punctation moderately sparse (i=1–2d). Supraclypeal area with punctation sparse (i=1–4d). Lower paraocular and antennocular areas with punctation moderately sparse, shallow (i=1–2d). Upper paraocular area, frons, and ocellocular area reticulate-punctate. Gena lineolate. Postgena imbricate. Mesoscutum tessellate-imbricate, punctation fine and shallow, moderately dense between parapsidal lines (i=1–1.5d), dense laterad of parapsidal line (i≤d), contiguous on anterolateral portion. Mesoscutellum polished, weakly imbricate, submedial punctation moderately dense (i=1–3d). Axilla punctate. Metanotum reticulate-punctate. Preëpisternum weakly rugulose. Hypoepimeral area ruguloso-imbricate. Mesepisternum granular-imbricate, obscurely punctate ventrally. Metepisternum with dorsal third rugoso-carinulate, ventral portion imbricate. Metapostnotum with fine anastomosing rugae, not extending much more than ¾ distance to posterior margin, posterior half weakly imbricate. Propodeum with dorsolateral slope weakly imbricate, lateral surface imbricate-tessellate, posterior surface tessellate. Metasomal terga polished except apical impressed areas weakly coriarious, punctation on basal halves distinct (i=1.5–2d), T1–T2 apical impressed areas impunctate, T3–T4 apical impressed areas impunctate anterolaterally.

Structure. Head elongate (length/width ratio = 0.99–1.09). Eyes convergent below (UOD/LOD ratio = 1.19). Clypeus 3/4 below suborbital tangent, apicolateral margins strongly convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3 branches. Metapostnotum moderately elongate (MMR ratio = 1.23), posterior margin rounded onto posterior surface. Propodeum with oblique carina virtually absent, lateral carina weak, reaching less than halfway to dorsal margin.

MALE. Unknown

Range. New Mexico, possibly Colorado, Wisconsin (Fig. 131). **USA**: NM, CO, WI?.

Additional material examined. USA: COLORADO: 1♀ Rio Grande, the south fork, N37°33′ W106°47′, 9250 ft., 18–19.vi.1919; [AMNH]; WISCONSIN: 1♀ Oconto Co., Sunrise Lake Rd., N45°13.4571′ W88°27.5446′, 24.v.2005 (A. Wolf); [PCYU].

DNA Barcode. Available. Single sequence.

Comments. Rare. *Lasioglossum hemimelas* has not been recorded from the eastern USA except for a single specimen from Wisconsin (see Wolf & Ascher 2009). The Wisconsin specimen has been DNA barcoded and is distinct from *L. versans*. The Wisconsin specimen is disjunct from the species' type locality. This is a member of the *L. ruidosense* species-group (defined below), which contains only three nominal species but may be much more diverse (J. Gibbs unpublished data). Populations of the *L. ruidosense* species-group, such as those at the type locality of *L. hemimelas* are typically limited to high elevations in the south-western USA or high latitudes, ranging to the arctic. Such high altitude populations may be isolated to such an extent that they warrant being considered distinct species. It is possible that the

Wisconsin specimen, although matching the diagnostic characters of *L. hemimelas*, will prove not to be conspecific. The Wisconsin specimen has a shorter head (length/width ratio = 0.99) than the holotype and the name is applied to the Wisconsin specimen with some uncertainty.

FIGURE 133. *Lasioglossum hemimelas* (Cockerell) female, dorsal view of mesosoma.

The *Lasioglossum ruidosense* species-group

Species included. *Lasioglossum hemimelas*, *L. ruidosense*, and *L. versans*.

Diagnosis. Members of the *L. ruidosense* species-group are easily recognised by the following combination of characters in addition to the subgeneric characters of *Dialictus*. Head and mesosoma dull metallic, mesoscutal punctures widely separated between parapsidal lines, mesepisternum granular-imbricate, metasomal terga dark brown. *Females*: T1 anterior surface with evenly distributed erect hairs but no appressed hair fan, propodeum *usually* with lateral carina short not reaching dorsal margin. *Males*: Gonocoxite basally much wider than gonobase, gonostylus with medially directed elongate hairs, penis valve with strong dorsal crest.

Distribution. Alaska, east to Nova Scotia, south to high elevations in northern Mexico.

Lasioglossum (*Dialictus*) *heterognathum* (Mitchell)

Dialictus heterognathus Mitchell, 1960: 397. ♀.

Holotype. ♀ USA, North Carolina, Grandfather Mt., 27.vi.1952, [NCSU]. Examined.

Dialctus banksi Mitchell, 1960: 434. ♂. *Lapsus calami*.

Holotype. ♂ USA, North Carolina, West End, 14.vi.1950, (Mitchell); [NCSU]. Examined.

Taxonomy. Knerer and Atwood, 1963: *Dialictus heterognathus* ♂, p. 167 (description); Knerer and Atwood, 1966a: *D. heterognathus*, p. 882 (synonymy); Krombein, 1967: *Lasioglossum* (*Dialictus*) *heterognathum*, p. 463 (catalogue); Hurd,

1979: *Dialictus heterognathus*, p. 1966 (catalogue); Moure & Hurd, 1987: *Dialictus heterognathus*, p. 103 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *heterognathum* ♀♂, p. 136 (redescription, key).

Diagnosis. Female *L. heterognathum* can be recognised by the following diagnostic combination: hypostomal carinae divergent towards mandible bases (Fig. 10B), gena wider than eye, mesoscutal punctures fine, and scopa present. They are similar to *L. apocyni* and *L. imitatum*, which both have hypostomal carinae parallel and female *L. imitatum* have T3–T4 with coarse white hairs (Fig. 20A).

Male *L. heterognathum* can be recognised by the following diagnostic combination: facial tomentum dense only on lower paraocular area; flagellomeres elongate (length/width ratio = 1.50–1.85); dorsolateral angles of pronotum obtuse; mesoscutum dull due to weak microsculpture, punctures sparse between parapsidal lines (i=2–3d); mesepisternal punctures fine but distinct (i=1–3d); and apical impressed areas of the metasomal terga impunctate. They are most similar to *L. wheeleri*, which have pronotal dorsolateral angles acute.

Range. Nova Scotia to Ontario, west to Minnesota, and south to North Carolina. **USA**: CT, ME, MI, MN, NH, NY, NC, PA, VT, WV, WI. **CANADA**: NB, NS, ON, PQ.

DNA Barcode. Available. Multiple sequences.

Comments. Common. See Gibbs (2010b).

Lasioglossum (*Dialictus*) *illinoense* (Robertson)

Halictus illinoensis Robertson, 1892: 271. ♀.

Lectotype. ♀ USA, Illinois, Macoupin Co., Carlinville, 12.viii.1891, (C. Robertson); [INHS: 11933] by W. E. LaBerge (in Webb 1980). Examined.

Halictus illinoisensis Smith, 1910: 688. (Emend.)

Taxonomy. Robertson, 1902b: *Chloralictus Illinoensis*, p. 249 (key); Michener, 1951: *Lasioglossum* (*Chloralictus*) *illinoense*, p. 1114 (catalogue); Mitchell, 1960: *Dialictus illinoensis* ♀♂, p. 399 (redescription, key); Krombein, 1967: *Lasioglossum* (*Dialictus*) *illinoense*, p. 464 (catalogue); Hurd, 1979: *Dialictus illinoensis*, p. 1966 (catalogue); Moure & Hurd, 1987: *Dialictus illinoensis*, p. 105 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *illinoense* ♀♂, p. 149 (redescription, key).

Diagnosis. Female *L. illinoense* can be distinguished from all other North American *Dialictus* by protrochanter conically produced (Fig. 8A). They are further recognisable by the combination of head wide (length/width ratio = 0.90–0.92); clypeus with wide distal margin; propodeum with very strong carina delimiting lower margin of dorsolateral slope; and mesoscutal punctures fine, sparse between parapsidal lines, denser laterad of parapsidal line.

Male *L. illinoense* can be recognised by the following diagnostic combination: clypeus with distal margin yellow; head wide (length/width ratio = 0.94–0.95); mesoscutum with posterior half polished due to lack of microsculpture, punctures fine, sparse between parapsidal lines (i=1–3d); mesepisternum rugulose; metasomal terga with apical halves impunctate except along premarginal line; and metasomal sterna with relatively sparse plumose hairs.

Range. Nova Scotia, south to Georgia, Mississippi, west to Kansas. **USA**: GA, IL, IN, KS, KY, MD, MI, NC, NJ, NY, PA, SC, TN, TX, VA, WI, WV.

DNA Barcode. Available. Multiple sequences.

Comments. Common. See Gibbs (2010b).

Lasioglossum (*Dialictus*) *imitatum* (Smith)

Halictus imitatus Smith, 1853: 71. ♂.

Holotype. ♂ North America [BMNH: B.M. type 17a 999]. Examined.

Halictus inconspicuus Smith, 1853: 73. ♀.

Holotype. ♀ North America [BMNH: B.M. type 17a 1007]. Examined.

Halictus stultus Cresson, 1872: 254. ♀

Lectotype. ♀ USA, Texas, Bosque Co., (G.W. Belfrage); [ANSP: 2113] designated herein. Examined.

Chloralictus sparsus Robertson, 1902: 249. ♀♂.

Lectotype. ♀ USA, Illinois, Macoupin Co., Carlinville, 2.vi.1886 (C. Robertson); [INHS: 1293] by W. E. LaBerge (in Webb 1980). Examined.

Halictus hortensis Lovell, 1905a: 39. ♀.

Lectotype. ♀ USA, Maine, Waldoboro, on "cultivated blackberry", 19.vi, (Lovell); [NMNH: 71568] designated herein. Examined.

Halictus (*Chloralictus*) *insolitus* Sandhouse, 1924: 41. ♂

Holotype. ♂ USA, Iowa, Vinton, 23.vi.1922 [NMNH: 26446]. Examined.

Dialictus lectus Mitchell, 1960: 438. ♂.

Holotype. ♂ USA, Georgia, Kennesaw Mt., 1.ix.1946, [NCSU]. Examined.

Taxonomy. Cockerell, 1905: *Halictus inconspicuus* ♂, p. 349, *H. imitatus* ♀, p. 350 (tax. notes); Lovell, 1908: *Halictus hortensis* ♂, p. 39 (description); Viereck, 1916: *Halictus* (*Chloralictus*) *sparsus*, p. 706 (key); Michener, 1951: *Lasioglossum* (*Chloralictus*) *imitatum*, p. 1114, *L.* (*C.*) *inconspicuum*, p. 1114, *L.* (*C.*) *insolitum*, *L.* (*C.*) *sparsum*, p. 1027 (catalogue, synonymy); Michener, 1953: *Lasioglossum* (*Chloralictus*) *sparsum*, p. 1027 (larva); Krombein, 1958: *Lasioglossum* (*Chloralictus*) *inconspicuum*, p. 230, (catalogue); Mitchell, 1960: *Dialictus imitatus* ♂, p. 400, *D. inconspicuus* ♀, p. 400 (redescription, key); Knerer and Atwood, 1962b: *D. imitatus*, p. 168 (synonymy); Krombein, 1967: *Lasioglossum* (*Dialictus*) *imitatum*, p. 464; *L.* (*D.*) *lectum*, p. 464 (catalogue); Hurd, 1979: *Dialictus imitatus*, p. 1967, *D. insolitus*, p. 1967, *D. lectus*, p. 1968 (catalogue); Moure & Hurd, 1987: *Dialictus imitatus*, p. 105, *D. insolitus*, p. 109, *D. lectus*, p. 110 (catalogue); Pesenko *et al*., 2000: *Evylaeus imitatus*, p. 46 (review); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *imitatum* ♀♂, p. 156 (redescription, key, synonymy).

Diagnosis. Female *L. imitatum* can be recognised by the distinct coarse hairs on T3–T4 (Fig. 20A). They may be further distinguished by size small (3.4–5.0 mm), gena wider than eye, hypostomal carinae parallel, punctures fine, and sculpturing weak throughout.

Male *L. imitatum* can be recognised by the following diagnostic combination: size small (4.2–4.3 mm); head moderately elongate (length/width ratio = 1.00–1.02); moderately facial tomentum sparse, except on lower paraocular area; mesoscutum weakly imbricate, punctures fine punctures, sparse between parapsidal lines (i=1.5–2.5d); hypoepimeral area and lower mesepisternum obscurely punctate; metapostnotum smoothly rounded onto posterior surface; and apical impressed areas of metasomal terga impunctate.

Range. Nova Scotia, south to Florida and west to Alberta, California. **USA**: AL, AR, AZ, CO, CT, GA, IA, IL, IN, KS, KY, MA, ME, MI, MN, MS, NC, NY, PA, PE, SC, SD, TN, TX, VA, WI, WV. **CANADA**: MB, NS, ON, PQ, SK.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Lasioglossum imitatum is known to form eusocial colonies (Michener & Wille 1961; as *L. inconspicuum*).

The specimen of *Halictus stultus* indicated above is designated herein as the lectotype to ensure stability in the application of the name. Some of Cresson's syntype series include more than one species, which could potentially lead to taxonomic confusion. Likewise, the specimen of *Halictus hortensis* indicated above is designated as the lectotype to ensure nomenclatural stability.

Lasioglossum (*Dialictus*) *izawsum* Gibbs, new species

(Figures 134–138)

Holotype. ♀ USA, Massachusetts, Franklin Co., Montague WMA, N42.56767 W072.51897, 7–8.x.2008 (J. Milam); [PCYU].

Diagnosis. Female *L. izawsum* can be recognised by the following diagnostic combination: labrum with flattened apical process, dorsal keel absent (Fig. 6B); pronotal ridge carinate; scopa absent; mandible with small preapical tooth; and gena subequal to eye in width. They are most similar to *L. simplex*, *L. furunculum*, *L. sitocleptum* and *L. michiganense*. Female *L. furunculum*, *L. simplex*, and *L. sitocleptum* lack a preapical tooth on the mandible. *Lasioglossum simplex* also lacks a carinate pronotal ridge. Female *L. michiganense* have gena wider than eye and mesepisternum vertically carinulate.

Male *L. izawsum* can be recognised by the following diagnostic combination: head and mesosoma green, lower paraocular area with moderately dense tomentum, postgena imbricate, pronotal ridge carinate, mesoscutum imbricate, and S7 median lobe acuminate. They are most similar to *L. platyparium*, *L. michiganense* and *L. cephalotes*. Male *L. platyparium* are bluish with polished postgena. Male *L. michiganense* have S7 median lobe clavate. Male *L. cephalotes* have a stronger pronotal collar and denser tomentum on the lower paraocular area.

Description. FEMALE. Length 4.17–4.54 mm; head length 1.24–1.27 mm; head width 1.46–1.48 mm; forewing length 3.15–3.27 mm.

FIGURE 134. *Lasioglossum izawsum* Gibbs female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 135. *Lasioglossum izawsum* Gibbs female, dorsal view of mesosoma.

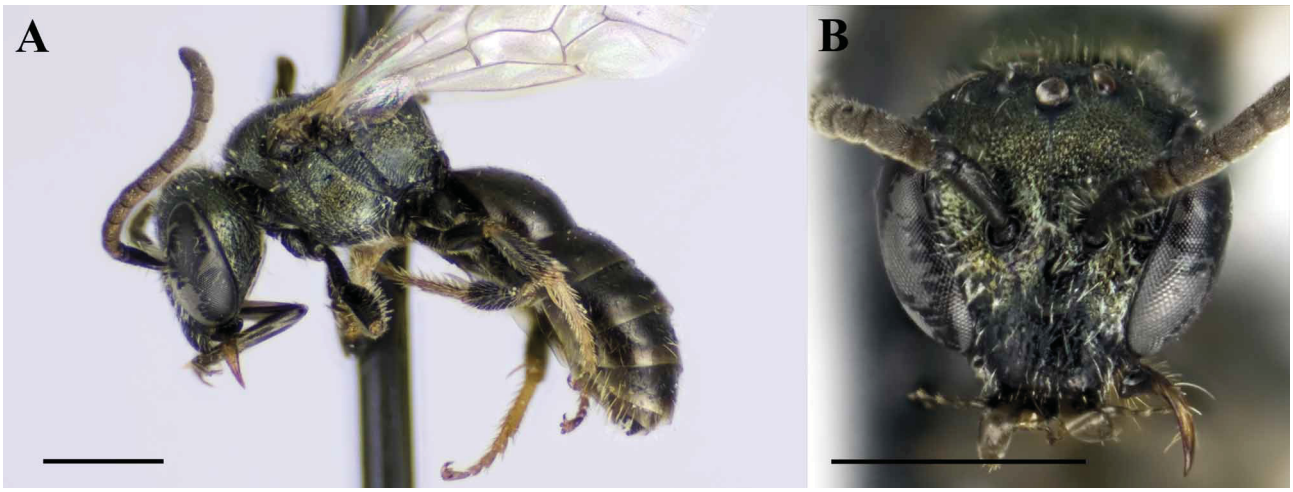

FIGURE 136. *Lasioglossum izawsum* Gibbs male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

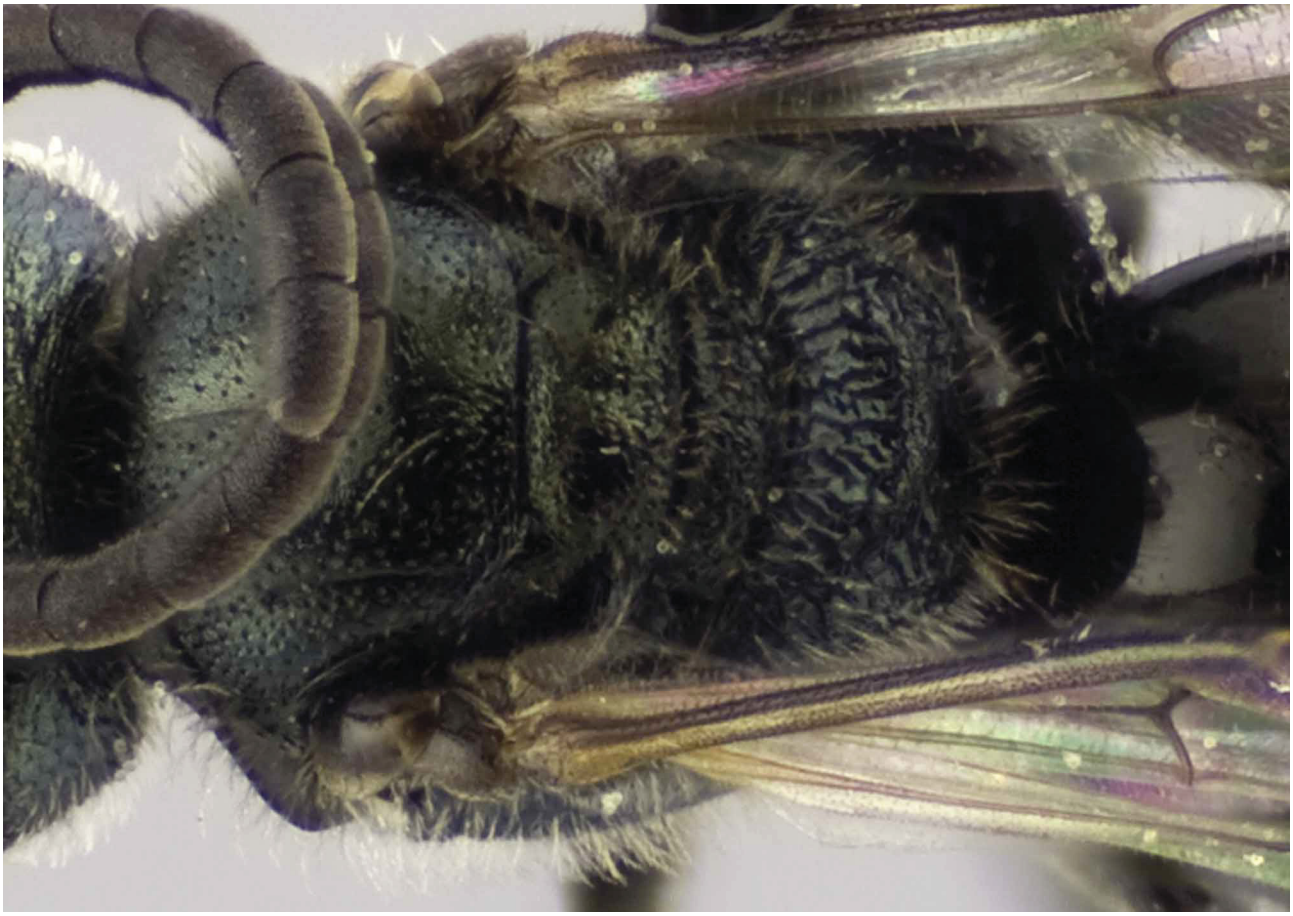

FIGURE 137. *Lasioglossum izawsum* Gibbs male, dorsal view of mesosoma.

Colouration. Head and mesosoma blue to bluish green. Clypeus with apical 1/2 blackish brown. Antenna dark brown, ventral surface reddish brown. Tegula reddish brown to brownish yellow. Wing subhyaline, venation and stigma dark yellowish brown. Legs brown, except tarsi reddish brown. Metasoma dark brown, terga and sterna with apical margins translucent brownish yellow.

Pubescence. Dull white. Sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Inner eye margin with subappressed hairs. Pronotal collar without dense tomentum. Propodeum with moderately sparse plumose hairs on lateral and posterior surfaces (1.5–2 OD).

Mesofemoral and mesotibial combs dense but short relative to non-parasitic species. Metafemoral scopa reduced relative to nest-building species, only a few elongate hairs curving above ventral surface. Penicillus greatly reduced, indistinguishable from other hairs. Metasomal terga with moderately sparse, fine hairs. T1 acarinarial fan with dorsal opening subequal to width of lateral hair patches. T2–T3 basolaterally and T4 entirely with very sparse tomentum. T2 apicolateral and T3–T4 apical margins with very sparse fringes. Sternal hairs erect, posteriorly directed (1.5–2.5 OD).

Surface sculpture. Face polished, punctation fine. Clypeus with punctation sparse (i=1.5–3d). Supraclypeal area with punctation moderately sparse (i=1–3d). Lower paraocular and antennocular areas with punctation moderately sparse (i=1–1.5d). Upper paraocular area and frons with punctation contiguous. Ocellocular area punctate (i=1–1.5d). Gena lineolate. Postgena imbricate. Mesoscutum weakly imbricate, more polished posteriorly, punctation fine, sparse between parapsidal lines (i=1–2.5d), denser laterad of parapsidal line (i≤d) and contiguous on anterolateral portion. Mesoscutellum similar to mesoscutum, submedial punctation sparse (i=1–3d). Axilla punctate. Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area ruguloso-imbricate. Mesepisternum dorsal half rugulose, ventral half imbricate. Metepisternum with dorsal 1/3 carinulate, ventral 2/3 imbricate. Metapostnotum nearly completely rugoso-carinulate, posterior margin imbricate. Propodeum with dorsolateral slope rugulose-imbricate, lateral surface imbricate, posterior surface imbricate-tessellate. Metasomal terga polished except apical impressed areas faintly coriarious, punctation dense basally (i=1–1.5d), apical half sparse (i=1.5–3d), T1 apical impressed area impunctate medially.

Structure. Head very wide (length/width ratio = 0.84–0.87). Eyes convergent below (UOD/LOD ratio = 1.17–1.21). Labrum enlarged and flattened with distinct basal tubercle, apical process without dorsal keel. Mandible slender, extending beyond opposing clypeal angle, preapical tooth small. Clypeus 1/3 below suborbital tangent, apicolateral margins strongly convergent. Antennal sockets distant (IAD/OAD > 1.4). Frontal line carinate, ending 2 OD below median ocellus. IOD subequal to OOD. Gena subequal to eye. Pronotal dorsolateral angle slightly obtuse. Pronotal ridge carinate, not interrupted by oblique sulcus. Basitibial plate with apical carina weak. Inner metatibial spur pectinate with 3–4 short branches. Metapostnotum truncate (MMR ratio = 1.32–1.35), posterior margin narrowly rounded onto posterior surface. Propodeum with oblique carina very weak, lateral carina not reaching dorsal margin. T5 medial specialized area reduced in size relative to non-parasitic species.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length mm 4.05 mm; head length 1.32–1.43 mm; head width 1.42–1.49 mm; forewing length 3.15 mm.

Colouration. Flagellum ventral surface reddish brown. Legs brown, except tibial bases and apices, and tarsi yellow to brownish yellow.

Pubescence. Face below eye emargination with sparse tomentum, partially obscuring lower paraocular area, nearly absent from clypeus and supraclypeal area. S2–S5 lateral portions with moderately spare plumose hairs (1–1.5 OD).

Surface sculpture. Lower paraocular and supraclypeal areas moderately sparse (i=1–2d). Frons reticulate, punctation moderately sparse between parapsidal lines (i=1–2.5d), dense laterad of parapsidal line and on anterolateral portion (i≤d). Mesepisternum rugulose. Metapostnotum crescentic, completely rugoso-carinulate. Propodeum with dorsolateral slope rugose, posterior surface rugulose-imbricate. Metasomal terga distinctly punctate (i=1–2d), apical impressed margin impunctate.

Structure. Head wide (length/width ratio = 0.93–0.96). Eyes strongly convergent below (UOD/LOD ratio = 1.48–1.56). Clypeus 2/3 below suborbital tangent, apicolateral margins convergent. Antennal sockets distant (IAD/OAD = 1.5). Frontal line carinate, ending 2 OD below median ocellus. IOD subequal to OOD. Pedicel subequal to F1. F2 length 1.8X F1. F2–F10 moderately short (length/width ratio = 1.40–1.50). Pronotal ridge carinae. Metapostnotum relatively long (MMR ratio = 1.18), posterior margin narrowly rounded onto posterior surface.

Terminalia. S7 with median lobe acuminate, apex rounded (Fig. 138). S8 with apicomedial margin weakly convex (Fig. 138). Genital capsule as in Fig. 138. Gonobase with ventral arms separated. Gonostylus small, dorsal setae elongate. Retrorse lobe moderately elongate, weakly attenuated apically.

Range. Massachusetts, Pennsylvania (Fig. 139). **USA**: MA, PA.

Allotype. ♂ **USA:** MASSACHUSETTS: Franklin Co., Montague WMA, powerline corridor, N42.56610 W072.53341, 5.x.2008 (Milam & King); [PCYU].

Paratypes. USA: MASSACHUSETTS: 1♀ Franklin Co., Montague WMA, gravel pit, N42.56767 W072.51879, 7–8.x.2008 (J. Milam); 1♂ Franklin Co., Montague WMA, gravel pit, N42.55853 W072.52180, 5–6.x.2008 (J. Milam); [PCYU]; 1♀ Franklin Co., Montague WMA, Pt. 42, treated pitch-pine, N42.56321 W072.53181, 20–21.x.2009 (J. Milam); 1♀ Franklin Co., Montague WMA, Pt. 56, treated pitch-pine, N42.56212 W072.51859, 20–21.x.2009 (J. Milam); 1♀ Franklin Co., Montague WMA, Pt. 108, treated pitch-pine, N42. 56767 W072.51897, 2–5.x.2009 (J. Milam);

1♂ Franklin Co., Montague WMA, Pt. 119, treated pitch-pine, N42.55853 W072.52180, 8.ix.2010 (J. Milam); 3♀♀ Franklin Co., Montague WMA, Pt. 119, treated pitch-pine, N42.55853 W072.52180, 5–6.x.2009 (J. Milam); 1♀ Franklin Co., Montague WMA, large gravel pit, N42.56957 W072.53617, 30.iv.2010 (D. King); [CUIC]; PENNSYLVANIA: 1♀ Westmoreland Co., Powdermill Nature Res., nr. Rector,29.iv.1945 (C.J. McCoy); [UCMC].

Etymology. The specific epithet is treated as a noun in apposition.

DNA Barcode. Available. Multiple sequences.

Comments. Rare.

Lasioglossum izawsum is presumably a social parasite or cleptoparasite of nest-building *Dialictus*. The host is unknown but *L. izawsum* is almost exclusively known from sites where the new species *L. katherineae* (described below) has been found in abundance.

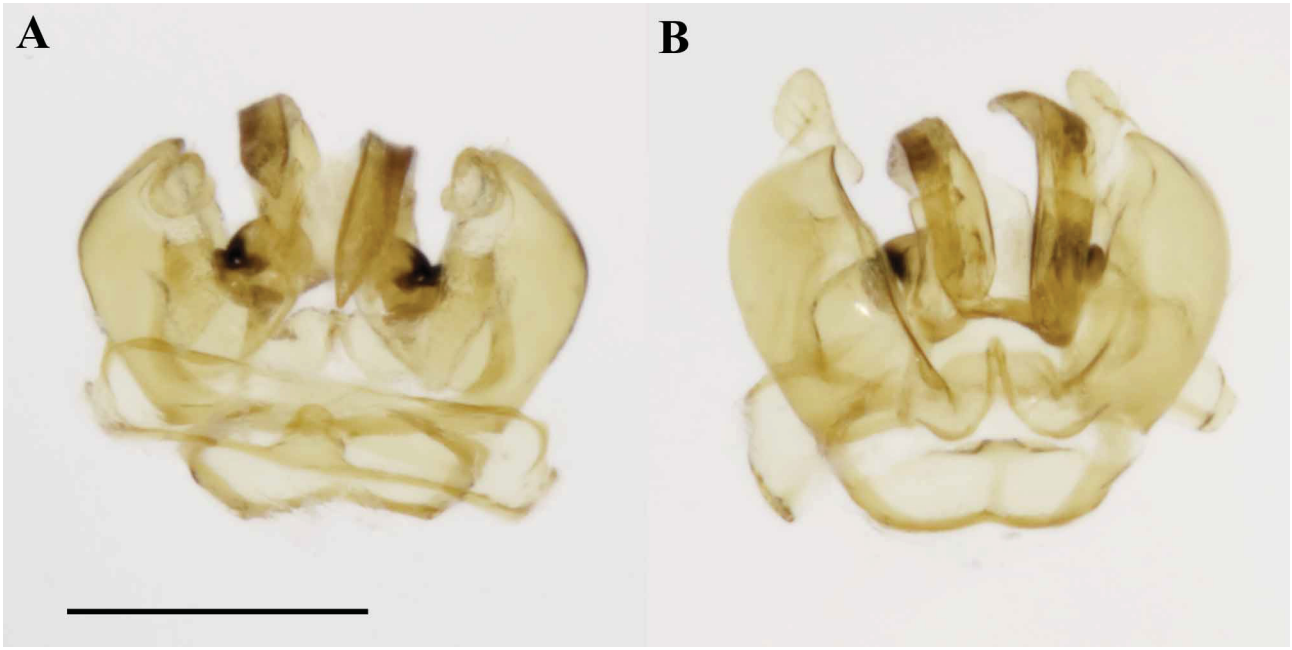

FIGURE 138. *Lasioglossum izawsum* Gibbs, new species male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

Lasioglossum (*Dialictus*) *katherineae* Gibbs, new species

(Figures 140–144)

Holotype. ♀ USA, Iowa, Allamakee Co., Waymiller prairie, 12.5 km N. Lansing, N43°27′15″ W091°18′13″, 323 m, 18.vii.2005 (C. Owens); [PCYU]

Diagnosis. Female *L. katherineae* can be recognised by diagnostic combination of head relatively large, nearly quadrate (length/width ratio = 0.97–1.01); clypeus apicolateral margins strongly convergent; mesoscutum dull due to tessellate microsculpture, punctures sparse between parapsidal lines (Fig. 141); mesepisternum rugulose; tegula brownish yellow; metapostnotal rugae not reaching posterior margin; T1 acarinarial fan large, without dorsal opening (Fig. 141); metasomal terga with appressed tomentum. They are similar to *L. apocyni*, *L. fattigi* and *L. paradmirandum* but these species all have T1 acarinarial fan open dorsally.

Male *L. katherineae* are similar to females but lack T1 acarinarial fan. The large head (length/width ratio = 1.08) and brown metabasitarsus distinguish *L. katherineae* from male *L. apocyni* and *L. fattigi*.

Description. FEMALE. Length 4.48–4.84 mm; head length 1.37–1.57 mm; head width 1.40–1.56 mm; forewing length 3.09–3.81 mm.

Colouration. Head and mesosoma pale green to pale blue. Clypeus with apical half blackish brown, basal half and supraclypeal area sometimes golden. Antenna dark brown, flagellum with ventral surface reddish brown. Tegula amber. Wing membrane subhyaline, venation and pterostigma brownish yellow. Legs brown, except medio- and distitarsi reddish brown. Metasoma brown, terga and sterna with apical areas translucent brownish yellow.

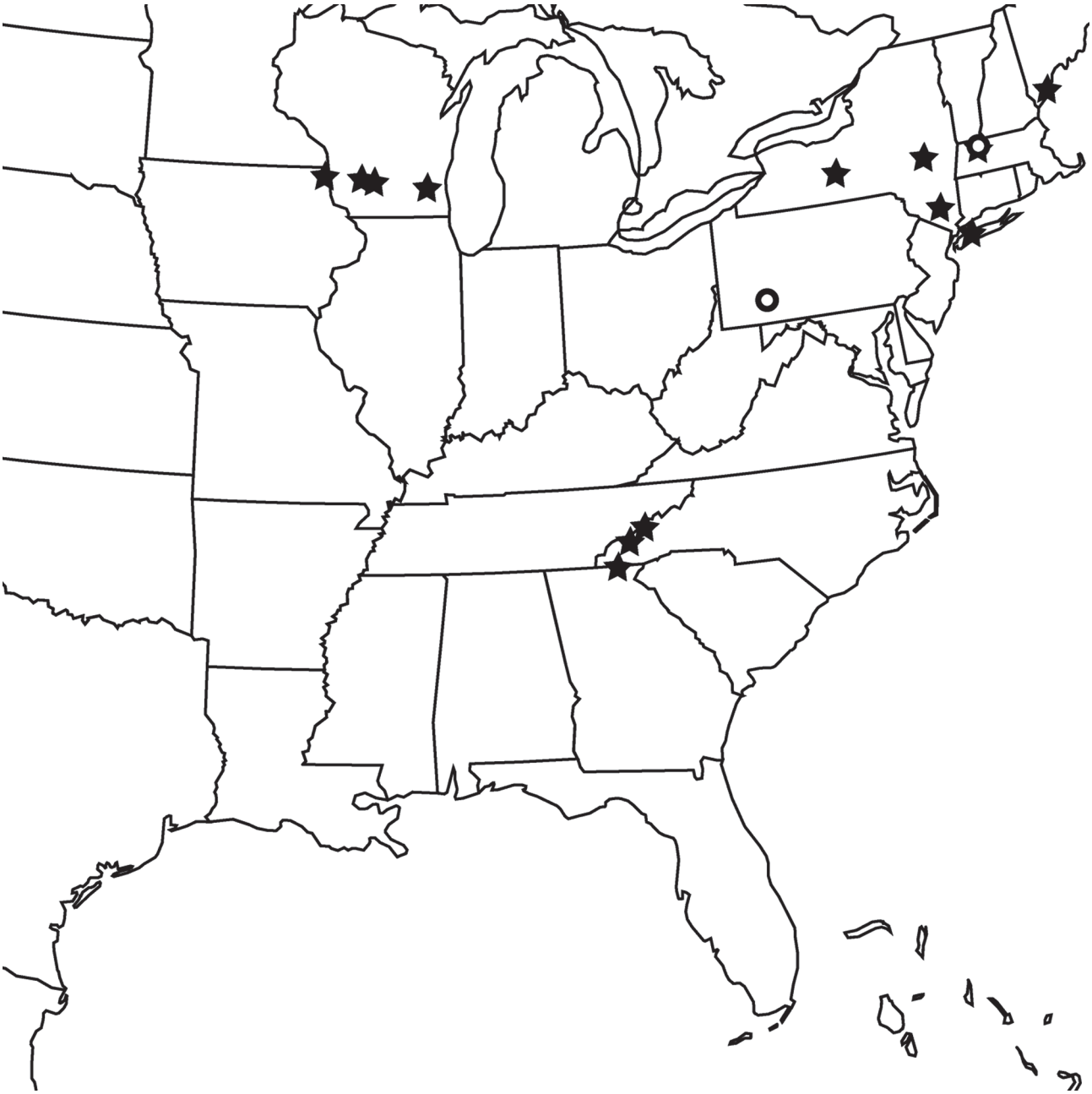

FIGURE 139. Distribution map of *Lasioglossum izawsum* (circles) and *L. katherineae* (stars).

Pubescence. Dull white. Moderately sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Lower paraocular area and gena with virtually no tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with sparse, fine hairs. T1 acarinarial fan large without dorsal opening. T2–T3 basolaterally and T4–T5 entirely with sparse tomentum not greatly obscuring surface. T2 apicolateral and T3–T4 apical margins with relatively dense apical fringes.

Surface sculpture. Face weakly imbricate, punctation moderately strong. Clypeus polished, punctation sparse (i=1–3d). Supraclypeal area with punctation sparse (i=1–3d). Lower paraocular and antennocular areas with punctation moderately dense (i=1–1.5d). Upper paraocular area and frons reticulate-punctate. Ocellocular area minutely punctate (i=1–1.5d). Gena weakly lineolate. Postgena polished, weakly imbricate. Mesoscutum weakly tessellate-imbricate, punctation fine, moderately dense between parapsidal lines (i=1–1.5d), dense laterad of parapsidal line (i≤d), and reticulate on anterolateral portion. Mesoscutellum similar to mesoscutum, submedial punctation sparse (i=1–3d). Axilla punctate.

FIGURE 140. *Lasioglossum katherineae* Gibbs female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 141. *Lasioglossum katherineae* Gibbs female, dorsal view of mesosoma.

Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate. Mesepisternum rugulose, posteriorly rugulose-imbricate. Metepisternum dorsal half rugoso-carinulate, ventral portion imbricate. Metapostnotum weakly rugoso-carinulate not reaching posterior margin, imbricate posteriorly. Propodeum with dorsolateral slope imbricate, lateral surface imbricate-tessellate, and posterior surface tessellate. Metasomal terga polished except apical impressed areas coriarious, punctation on basal halves moderately dense (i=1–1.5d), obscure on apical halves (i=2–2.5d), T1 dorsal portion and T2 apical half virtually impunctate.

FIGURE 142. *Lasioglossum katherineae* Gibbs male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Structure. Head round (length/width ratio = 0.97–1.01). Eyes convergent below (UOD/LOD ratio = 1.21–1.31). Clypeus ½ below suborbital tangent, apicolateral margins strongly convergent. Antennal sockets moderately close (IAD/OAD < 0.6). Frontal line carinate, ending 2.5 OD below median ocellus. IOD subequal to OOD. Gena subequal to eye. Inner metatibial spur pectinate with 3–5 branches. Metapostnotum moderately elongate (MMR ratio = 1.32–1.40), posterior margin rounded onto posterior surface. Propodeum with oblique carina virtually absent, lateral carina weak, reaching halfway to dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 5.14 mm; head length 1.63 mm; head width 1.51 mm; forewing length 3.81 mm.

Colouration. Flagellomeres with ventral surface orange-yellow. Legs brown.

Pubescence. Face below eye emargination with moderately dense tomentum partially obscuring surface, denser on lower paraocular area. Metasomal terga with sparse basolateral tomentum. S2–S5 with moderately dense apicolateral patches of erect hairs.

Surface sculpture. Clypeal punctation relatively dense (i=1–1.5d). Metanotum rugose. Metapostnotum with moderately strong rugae nearly reaching posterior margin. Propodeum with dorsolateral slope rugose, lateral and posterior surfaces ruguloso-imbricate. Metasomal terga polished, punctation moderately dense (i=1–2d), apical impressed areas impunctate.

Structure. Head elongate (length/width ratio = 1.08). Eyes strongly convergent below (UOD/LOD ratio = 1.50). Antennal sockets distant (IAD/OAD > 1.2). Frontal line carinate, ending 2OD below median ocellus. Pedicel shorter than F1. F2 length 1.8X F1. F2–F10 moderately elongate (length/width ratio = 1.57–1.71). Propodeum dorsal surface moderately elongate (MMR ratio = 1.27), posterior margin rounded onto posterior surface.

Terminalia. S7 with median lobe clavate, apex rounded (Fig. 144). S8 with apicomedial margin weakly convex (Fig. 144). Genital capsule as in Fig. 144. Gonobase with ventral arms widely separated. Volsella roughly ovoid. Gonostylus small, dorsal setae elongate. Retrorse lobe elongate, attenuated apically.

Range. Massachusetts west to Iowa (Fig. 139). **USA**: GA, IA, MA, ME, NC, NY, WI.

Allotype. ♂ **USA:** MASSACHUSETTS: Franklin Co., Montague WMA, powerline corridor 10033, N42.56297 W072.52999, 6.x.2009 (J. Milam) on *Solidago rugosa*; [PCYU].

Paratypes. USA: GEORGIA: 1♀ Hiawassee, 19.viii.1957 (L.A. Kelton); [CNC]; IOWA: 1♀ Allamakee Co., Capoli prairie, 8.2 km S. Lansing, N43°19′29″ W091°8′4″, 91 m, 19.vi.2005 (C. Owens); 1♀ Allamakee Co., Mullen prairie, 6.6 km S. Lansing, N43°19′14″ W091°9′32″, 305 m, 14.viii.2005 (R. Kay); [PCYU]; MAINE: 1♀ Deblois, 6.vi.1965 (E.A. Osgood); 2♀♀ Kennebunk, 5.vi.1952; [UMDE]; MASSACHUSETTS: 1♀ Franklin Co., Montague WMA, N42.56321 W072.53181, 1–2.v.2008 (J. Milam); 1♀ Franklin Co., Montague WMA, N42.57205 W072.5227, 7–8.x.2008 (J. Milam); 1♀ Franklin Co., Montague WMA, 20.vii.2006 (M.F. Veit); [PCYU]; 1♂ Franklin Co., Montague WMA, Pt. 42, treated pitch-pine, N42.56321 W072.53181, 20–21.x.2009 (J. Milam); 1♀ Franklin Co., Montague WMA, Pt. 56, treated pitch-pine, N42.56212 W072.51859, 14–15.vii.2009 (J. Milam); 5♀♀ Franklin Co., Montague WMA, Pt. 56, treated pitch-pine, N42.56212 W072.51859, 22–23.vii.2009 (J. Milam); 2♀♀1♂ Franklin Co., Montague WMA, Pt. 56, treated pitch-pine, N42.56212 W072.51859, 20–21.x.2009 (J. Milam); 4♀♀ Franklin Co., Montague WMA, Pt. 90,

FIGURE 143. *Lasioglossum katherineae* Gibbs male, dorsal view of mesosoma.

treated pitch-pine, N42.57012 W072.52245, 18–19.viii.2010 (J. Milam); 1♀ Franklin Co., Montague WMA, Pt. 90, treated pitch-pine, N42.57012 W072.52245, 20–21.x.2010 (J. Milam); 1♀ Franklin Co., Montague WMA, Pt. 93, treated pitch-pine, N42.5638 W072.5336, 27–28.iv.2009 (J. Milam); 2♀♀ Franklin Co., Montague WMA, Pt. 93, treated pitch-pine, N42.5638 W072.5336, 24–25.vi.2009 (J. Milam); 1♂ Franklin Co., Montague WMA, Pt. 108, treated pitch-pine, N42. 56767 W072.51897, 2–5.x.2009 (J. Milam); 1♀ Franklin Co., Montague WMA, Pt. 119, treated pitch-pine, N42.55853 W072.52180, 14–15.vii.2009 (J. Milam); 1♂ Franklin Co., Montague WMA, Pt. 119, treated pitch-pine, N42.55853 W072.52180, 5–6.x.2009 (J. Milam); 1♂ Franklin Co., Montague WMA, roadside nr. Pt. 119, treated pitch-pine, N42.55787 W072.52234, 5.x.2009 (J. Milam); 1♂ Franklin Co., Montague WMA, roadside nr. Pt. 119, treated pitch-pine, N42.55787 W072.52234, 6.x.2009 (J. Milam); 4♀♀1♂ Franklin Co., Montague WMA, powerline corridor #1, N42.56297 W072.52999, 5–6.x.2009 (J. Milam); 1♀ Franklin Co., Montague WMA, gravel pit #4, N42.56862 W072.53409, 18–19.viii.2010 (J. Milam); 2♀♀ Franklin Co., Montague WMA, Pt. B, scrub/shrub, N42.56690 W072.53323, 1–2.v.2008 (J. Milam); 1♀ Franklin Co., Montague WMA, Pt. B, scrub/oak, N42.5669 W072.5332, 14–15.ix.2009 (J. Milam); 1♀ Franklin Co., Montague WMA, Pt. I, treated pitch-pine, N42.57205 W072.52270, 1–2.vii.2010 (J. Milam); 1♀ Franklin Co., Montague WMA, Pt. I, treated pitch-pine, N42.57029 W072.51985, 20–21.x.2009 (J. Milam); 1♀ Franklin Co., Wendell S.F., powerline corridor, N42.56955 W072.41493, 22–23.x.2009 (D. King); [CUIC] NEW YORK: 1♀ Central Park, 28.vi.1918; 1♀ Flatbush, 18.viii.1903 (J.L. Zabsiskie); 1♀ Orange Co., Cornwall, Black Rock Forest, 18 N4582302 E580161, 8.vii.2003 (V. Giles & J. Rozen); 1♀ Orange Co., Cornwall, Black Rock Forest, 18 N4582302 E580161, 26.vii.2003 (V. Giles & J. Rozen); 1♀ Otsego Co., Oneonta, Soccer Hall of Fame, 5.vii.2002 (J.S. Ascher); 1♀ Rensselaer Co., Brainard, 11–22.vii.1966 (P. & B. Wygodzinksy); 1♀ Ulster Co., Cherrytown, 4 mi NNW Kerhonkson, 15–30.vi.1971 (P. & B. Wygodzinsky); [AMNH]; 1♀ Albany Co., Rensselaerville, Huyck Preserve, 9.viii.1969 (G. & K. Eickwort); 1♀ Nassau Co., Valley Stream S.P., 2.vii.1974 (G.C. Eickwort); 1♀ Schulayer Co., W. Of Reynoldsville, Hector land use area, 28.vii.1968 (G. & K. Eickwort); [CUIC]; NORTH CAROLINA: 1♀ Bryson City, 14.iv.1923 (J.C. Crawford); 1♀ Bryson City, 25.iii.1923 (J.C. Crawford); 1♀ Bryson City, 15.iv.1923 (J.C. Crawford); WISCONSIN: 1♀ Sauk Co., T8N/R4E/Sec6/NE, 23.viii.1994 (TNC/DNR Study 053); [IRCW].

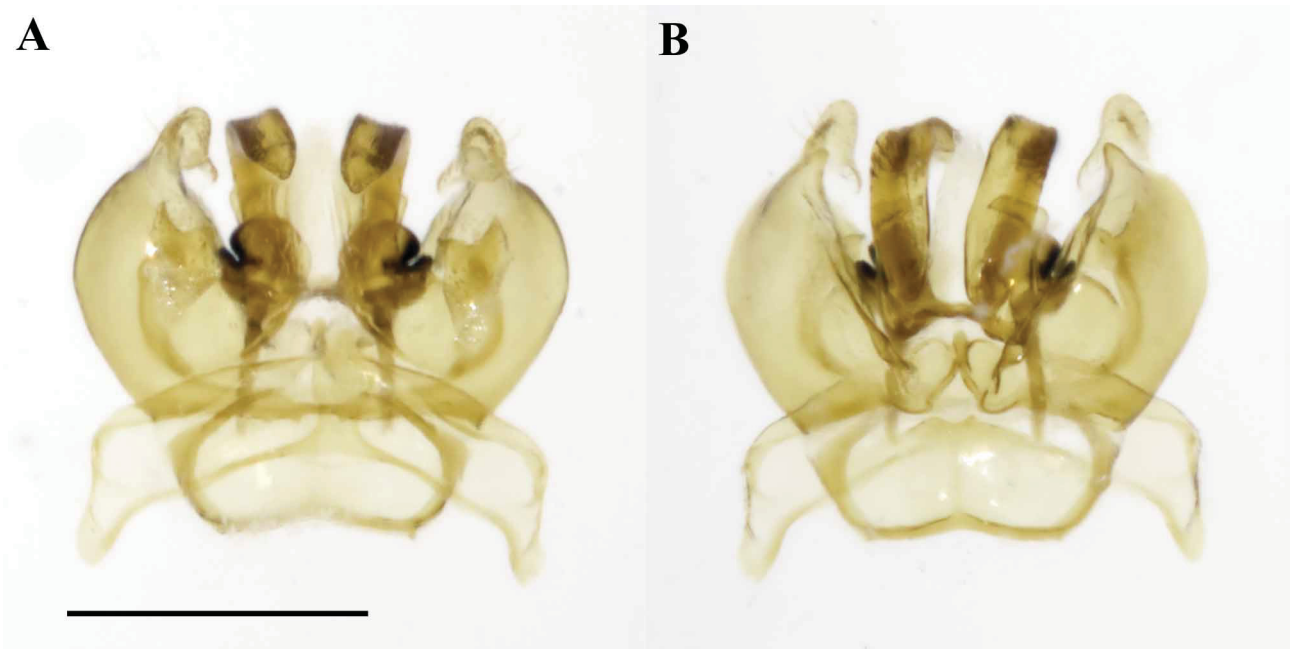

FIGURE 144. *Lasioglossum katherineae* Gibbs, new species male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

Floral records. ASTERACEAE: *Solidago rugosa*; CLUSIACEAE: *Hypericum*; ERICACEAE: *Vaccinium*.

Etymology. The specific epithet is named for Katherine Milam King whose mother collected the majority of specimens known.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon. The species has been uncommonly collected except in the Montague Plains Wildlife Management Area, Franklin County, Massachusetts where is has been collected in large numbers. The Montague Plains Wildlife Management Area is a pitch pine- scrub oak barren. The species may have particular habitat preferences that preclude its routine collection.

Lasioglossum (*Dialictus*) *laevissimum* (Smith)

Halictus laevissimus Smith, 1853: 72. ♀.

Holotype. ♀ Canada, Manitoba, Arctic America. South of Lake Winnipeg, [BMNH: B.M. Type 17a 1002]. Examined.

Halictus levissimus Dalla Torre, 1896: 68 (Emend.)

Halictus euryceps Ellis, 1914: 98. ♀.

Holotype. ♀ USA, New Mexico, Beulah, end of August, (Cockerell); [CAS: 15605]. Examined.

Halictus (*Chloralictus*) *phaceliarum* Cockerell, 1919: 299. ♀.

Holotype. ♀ USA, Colorado, Peaceful Valley, Colorado, 26.viii.1918 (W.P. Cockerell); [NMNH: 40260]. Examined.

Halictus (*Chloralictus*) *praepes* Sandhouse, 1924: 30. ♂.

Holotype. ♂ USA, Colorado, Peaceful Valley, 1919 (Cockerell); [NMNH: 26430]. Examined.

Halictus (*Chloralictus*) *astutus* Sandhouse, 1924: 31. ♂.

Holotype. ♂ USA, New Mexico, Beulah, 18.viii. (W. Porter); [NMNH: 26431]. Examined.

Halictus (*Chloralictus*) *abundus* Sandhouse, 1924: 32. ♂.

Holotype. ♂ USA, New Mexico, Beulah, end of viii (Cockerell); [NMNH: 26432]. Examined.

Halictus (*Chloralictus*) *tranquillum* Sandhouse, 1924: 32. ♂.

Holotype. ♂ USA, New Mexico, Santa Fe, vii (Cockerell); [NMNH: 26433]. Examined.

Halictus (*Chloralictus*) *jameseae* Cockerell, 1933: 41. ♂.

Holotype. ♂ USA, Colorado, Pingree Park, 15.viii.1932, (M. James); [CAS: 15610]. Examined.

Dialictus orbitatus Mitchell, 1960: 440. ♂. **[new synonymy]**

Holotype. ♀ USA, North Carolina, Bluff Park, Scenic Hgwy., [Doughton Park, Blue Ridge Pkwy], 24.vi.1948 (T.B. Mitchell); [NCSU]. Examined.

Dialictus solidaginis Mitchell, 1960: 443. ♂.

Holotype. ♂ USA, Michigan, Marquette Co., 20.vi.1955 (R.R. Dreisbach); [NCSU]. Examined.

Taxonomy. Cockerell, 1905: *Halictus laevissimus* ♀, p. 351 (tax. notes); Michener, 1951: *Lasioglossum* (*Chloralictus*) *abundus*, p. 1111, *L.* (*C.*) *astutus* p. 1112, *L.* (*C.*) *jameseae*, p. 1114, *L.* (*C.*) *laevissimum*, p. 1114, *L.* (*C.*) *phaceliarum*, p. 1116, *L.* (*C.*) *praepes*, p. 1116, *L.* (*C.*) *tranquillum*, p. 1118 (catalogue); Mitchell, 1960: *Dialictus laevissimus* ♀(♂ misdet.), p. 401 (redescription, key); Knerer & Atwood, 1962a: *Dialictus laevissimus* ♂, p. 1228 (description); Krombein, 1967: *Lasioglossum* (*Dialictus*) *laevissimum*, p. 464, *L.* (*D.*) *orbitatum*, p. 465, *L.* (*D.*) *solidaginis*, p. 466 (catalogue); Hurd, 1979: *Dialictus abundus*, p. 1963, *D. astutus*, p. 1964, *D. jameseae*, p. 1967, *D. orbitatus*, p. 1969, *D. phaceliarum*, p. 1970, *D. praepes*, p. 1970, *D. solidaginis*, p. 1971, *D. tranquillus*, p. 1972 (catalogue); Moure & Hurd, 1987: *Dialictus abundus*, p. 87, *D. astutus*, p. 91, *D. jameseae*, p. 109, *D. orbitatus*, p. 118, *D. phaceliarum*, p. 121, *D. praepes*, p. 124, *D. solidaginis*, p. 130, *D. tranquillus*, p. 135 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *laevissimum* ♀♂, p. 170 (redescription, key, synonymies).

Diagnosis. Female *L. laevissimum* can be recognised by the following diagnostic combination: size large (5.1–7.1 mm); head wide (length/width 0.89–0.95); gena often wider than eye, especially in larger individuals; mesoscutal punctures sparse between parapsidal lines (i=1–3d); mesepisternum rugulose; metapostnotum incompletely carinulate; T1 acarinarial fan nearly complete, dorsal opening narrow; metasomal terga blackish brown, apical halves impunctate (except along premarginal line), and T3 usually with sharply contrasted basal band of white tomentum. They are similar to *L. smilacinae*, which lacks any dorsal opening in the T1 acarinarial fan, and have metasomal terga with distinctly punctate apical impressed areas.

Male *L. laevissimum* can be recognised by the following diagnostic combination: size large (5.4–6.7 mm); face with dense tomentum limited to lower paraocular area; flagellomeres elongate (length/width ratio = 1.64–2.00); mesoscutum moderately polished due to weak microsculpture; mesepisternum rugulose, obscurely punctate ventrally; apical impressed areas of metasomal terga impunctate; and S3 with dense hairs. They are most similar to *L. abanci* and *L. ephialtum*. Male *L. abanci* have S3 with sparse hairs limited to apical portion. Male *L. ephialtum*, which has the mesoscutum dull due to microsculpture.

Range. Nova Scotia west to British Columbia, south to New Mexico. **USA**: CO, IL, MD, ME, MI, MN, NC, ND, NH, NM, NY, OH, PA, SD, UT, WI, WV. **CANADA**: AB, BC, MB, NB, NF, NS, NT, ON, PE, PQ, SK.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Lasioglossum laevissimum is known to form eusocial colonies (Packer 1992; Packer & Owen 1994).

Dialictus orbitatus is removed from synonymy with *L. obscurum* and placed into synonymy with *L. laevissimum*. *Halictus smilacinae*, long considered to be a synonym of *L. laevissimum*, is resurrected (see below).

Lasioglossum (*Dialictus*) *lepidii* (Graenicher)

Halictus (*Chloralictus*) *lepidii* Graenicher, 1927: 204. ♀♂.

Holotype. ♀ USA, Florida, South Miami, 20.iv.1927 (S. Graenicher); [NMNH:]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *lepidii*, p. 1114 (catalogue); Mitchell, 1960: *Dialictus tegularis* ♀♂, p. 423 (synonymy); Gibbs, 2009a: *Lasioglossum* (*Dialictus*) *lepidii* ♀♂, p. 22 (redescription, key).

Diagnosis. Both sexes of *L. lepidii* have tegula enlarged and strongly punctate with strong posterior angle (Fig. 7A). Female *L. lepidii* are most similar to *L. tegulare* but have extensive tomentum on the paraocular area. Male *L. lepidii* have the clypeus nearly entirely obscured by tomentum whereas similar species have the clypeus nearly bare.

Range. Florida.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon.

Until recently, *L. lepidii* was considered a junior synonym of *L. tegulare*. For a complete taxonomic treatment see Gibbs (2009a).

Lasioglossum (*Dialictus*) *leucocomum* (Lovell)

Halictus pilosus var. *leucocomus* Lovell, 1908: 37. ♀.

Lectotype. ♀ USA, Maine, Waldoboro, 28.v.1905 (J.H. Lovell); [NMNH: 71569] designated herein. Examined.

Dialictus otsegoensis Mitchell, 1960: 440. ♂. **[new synonymy]**

Holotype. ♂ USA, Michigan, Ostego Co., 7–24.vii.1955 (R.R. Dreisbach); [NCSU]. Examined.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *otsegoense*, p. 465 (catalogue); *Dialictus otsegoensis*, p. 1969 (catalogue); Moure & Hurd, 1987: *Dialictus otsegoensis*, p. 118 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *leucocomum* ♀, p. 175 (redescription, key).

Diagnosis. Female *L. leucocomum* can be recognised by the following diagnostic combination: head elongate (length/width ratio = 1.03–1.06), clypeus with apicolateral margins strongly convergent, supraclypeal area relatively short (0.65–0.86X clypeal length), mesoscutal punctures contiguous, metapostnotum rugoso-carinulate, and metasomal terga metallic with dense yellowish tomentum. They are most similar to *L. pilosum* and *L. succinipenne*. Female *L. pilosum* have the apicolateral margins of the clypeus subparallel. Female *L. succinipenne* have the supraclypeal area relatively long (0.80–0.90X clypeal length) and dense whitish tomentum on the metasomal terga.

Male *L. leucocomum* can be recognized by the combination of head elongate, clypeus yellow distally, mesoscutal punctures dense but distinctly separated medially, metasomal terga metallic. They are most similar to *L. pilosum* which have the mesoscutal punctures contiguous medially.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 4.25–5.13 mm; head length 1.32–1.63 mm; head width 1.22–1.45 mm; forewing length 3.44–3.75 mm.

Colouration. Labrum yellow. Mandible yellow. Clypeus distal margin yellow. Flagellum with ventral surface orange. Legs brown, except bases and apices of tibiae and tarsi yellow.

Pubescence. Moderately dense. Face below eye emargination with tomentum partially obscuring surface, dense on lower paraocular area. T1 acarinarial area with sparse fan of appressed hairs. T1 dorsolaterally, T2–T3 basolaterally and T4 basally with sparse tomentum. S2–S3 entirely and S4–S5 laterally with posteriorly directed hairs (1–1.5OD).

Surface sculpture. Clypeal punctation moderately dense (i=1–2d). Mesoscutal punctures distinctly separated medially (i=d). Mesepisternum reticulate-rugulose. Propodeum with dorsolateral slope and lateral and posterior surfaces rugulose. Metasomal terga punctation deep, distinct.

Structure. Head very elongate (length/width ratio = 1.08–1.12). Eyes convergent below (UOD/LOD ratio = 1.43–1.52). Clypeus 2/3 below suborbital tangent, apicolateral margins subparallel. Antennal sockets distant (IAD/OAD = 1.0). Frontal line carinate, ending 2OD below median ocellus. Pedicel subequal to F1. F2 length 1.6–1.8X F1. F2–F10 moderately elongate (length/width ratio = 1.38–1.63). Metapostnotum truncate (MMR ratio = 1.25–1.33), posterior margin weakly angled onto posterior propodeal surface.

Terminalia. Not examined.

Range. Nova Scotia, Maine west to Minnesota, south to Appalachian mountains of North Carolina. **USA**: CT, IN, MA, ME, MI, MN, NC, NH, NJ, NY, WI. **CANADA**: NB, NS, ON, PE.

Additional material examined. USA: NORTH CAROLINA: 1♀ 5.viii.1957 (W.R. Richards); [CNC].

DNA Barcode. Available. Multiple haplotypes.

Comments. Common.

Until recently, *L. leucocomum* had never been considered more than a subspecies of *L. pilosum* (Gibbs 2010b). Attempts to separate the males of *L. pilosum* and *L. leucocomum* using DNA barcoding have consistently failed to produce *L. leucocomum* sequences. Morphological study of *L. pilosum s.l.*, however, has revealed variability in mesoscutal puncture density. It is now believed, based on geographical patterns of co-occurence with females, that the males with sparser punctures are actually *L. leucocomum*. The holotype of *D. otsegoense*, considered by Gibbs (2010b) to be a junior synonym of *L. pilosum*, is of this form.

The name-bearing type has lectotype labels from both Mitchell and Covell. No publication by either of these authors could be found that makes a valid lectotype designation. *Lasioglossum leucocomum* was recently resurrected from synonymy with *L. pilosum* by Gibbs (2010b). To maintain stability of usage, the specimen indicated above is designated as the lectotype.

Lasioglossum (*Dialictus*) *leviense* (Mitchell)

(Figures 145–148)

Dialictus leviensis Mitchell, 1960: 403. ♀.

Holotype. ♀ USA, Florida, Levy Co., 13.ix.1955, on *Polygonum hydropiperoides*, (R.A. Morse); [FSCA]

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *leviense*, p. 464 (catalogue); Hurd, 1979: *Dialictus leviensis*, p. 1968 (catalogue); Moure and Hurd, 1987: *Dialictus leviensis*, p. 110 (catalogue).

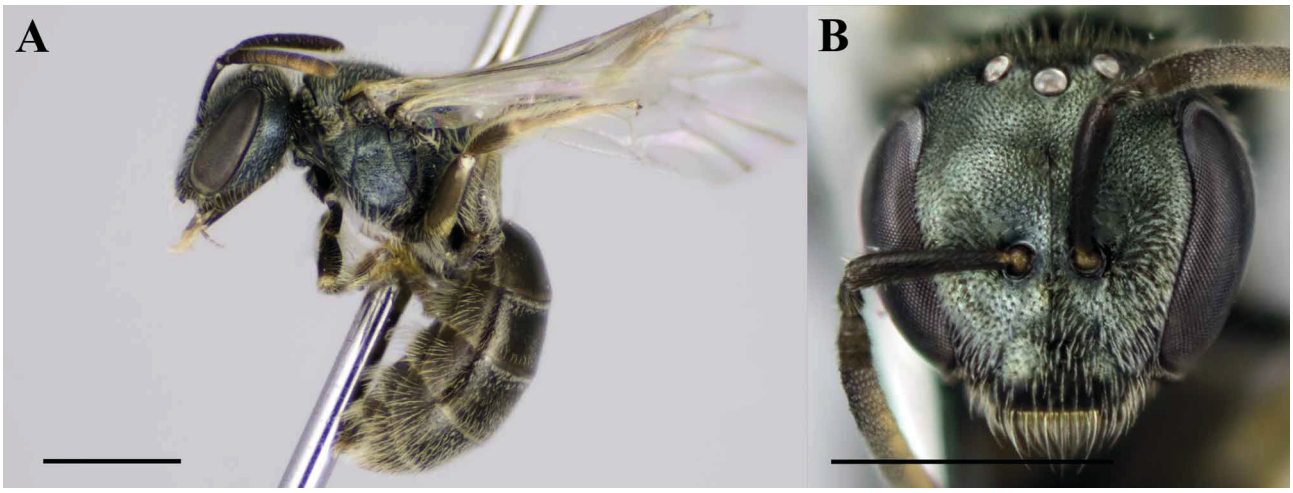

FIGURE 145. *Lasioglossum leviense* (Mitchell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Diagnosis. Female *L. leviense* can be recognised by the shape of the clypeus, which has the distal margin beyond the preapical fimbriae extending laterally making it noticeably wider than the preapical margin (Figs. 21B, 145B). The distal portion of the clypeus has a rectangular appearance as a result. They may be further distinguished by the following combination: head round (length/width ratio = 0.95–0.97); mesoscutum weakly tessellate, punctures moderately dense between parapsidal lines (i=1–2d) (Fig. 146); mesepisternum rugulose; tegula pale; tibiae with extensive brownish yellow; and T1 acarinarial fan with dorsal opening (Fig. 146). They are most similar to *L. mitchelli* and *L. weemsi*, both of which have a similarly shaped clypeus. Female *L. mitchelli* do not have a dorsal opening on the T1 acarinarial fan. Female *L. weemsi* have less pale colouration on the legs and slightly wider heads (length/width ratio = 0.93–0.96).

Male *L. leviense* can be recognised by the combination of clypeus with distal margin yellow; mesoscutum imbricate, punctation sparse between parapsidal lines (i=1–2.5d) (Fig. 148); mesepisternum finely rugulose-imbricate; tegula pale yellow; tibiae with yellow on anteroventral surface; metasomal terga without tomentum, apical impressed areas impunctate; and S4–S5 with apicolateral hairs. They are most similar to *L. apopkense* which are larger, more coarsely rugulose on mesepisternum, and tibiae more extensively brownish yellow.

Redescription. FEMALE. Length 3.81–4.54 mm; head length 1.22–1.39 mm; head width 1.28–1.44 mm; forewing length 3.09–3.33 mm.

Colouration. Head and mesosoma green with faint bluish reflections to mostly blue. Clypeus with apical half blackish brown. Antenna dark brown, flagellum with ventral surface brownish yellow. Tegula amber to pale yellow. Wing membrane subhyaline, venation and pterostigma pale brownish yellow. Legs brown, except tibiae basally and apically, protibial anterior surface, metatibial dorsal surface, and tarsi amber to brownish yellow. Metasoma dark brown, terga and sterna with apical margins translucent brownish yellow.

Pubescence. Dull white. Moderately sparse. Head and mesosoma with moderately sparse woolly hairs (1–2 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area with moderately sparse tomentum, partially obscuring surface. Gena with sparse tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately sparse, fine hairs. T1 acarinarial fan with wide dorsal opening. T2–T3 basolaterally and T4 entirely with sparse tomentum. T2 apicolateral and T3–T4 apical margins with sparse fringes.

FIGURE 146. *Lasioglossum leviense* (Mitchell) female, dorsal view of mesosoma.

FIGURE 147. *Lasioglossum leviense* (Mitchell) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Surface sculpture. Face imbricate, punctation fine. Clypeus with apical half polished, punctation sparse (i=1–3d). Supraclypeal area with punctation moderately sparse (i=1–2.5d). Lower paraocular area punctation dense (i≤d). Antennocular area punctation moderately dense (i=1–1.5d). Upper paraocular area and frons punctate-reticulate. Ocellocular area obscurely punctate (i≤d). Gena lineolate. Postgena imbricate. Mesoscutum weakly tessellate, punctation moderately dense between parapsidal lines (i=1–2d), dense laterad of parapsidal line (i≤d), contiguous on anterolateral portion. Mesoscutellum similar to mesoscutum, submedial punctation sparse (i=2–5d). Axilla minutely punctate. Metanotum

FIGURE 148. *Lasioglossum leviense* (Mitchell) male, dorsal view of mesosoma.

imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate. Mesepisternum dorsal half rugulose, ventral half ruguloso-imbricate, shiny. Metepisternum with dorsal third carinulate and ventral portion imbricate. Metapostnotum incompletely carinulate, posterior margin imbricate. Propodeum with dorsolateral slope and lateral surface imbricate, posterior surface tessellate. Metasomal terga polished, weakly coriarious on apical impressed areas, punctation distinct on basal half (i=1–1.5d), apical impressed areas with very obscure punctures.

Structure. Head very wide (length/width ratio = 0.95–0.97). Eyes convergent below (UOD/LOD ratio = 1.22–1.28). Clypeus ½ below suborbital tangent, apicolateral angle subparallel. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2–2.5 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum moderately truncate (MMR ratio = 1.25–1.42), posterior margin rounded onto posterior surface. Propodeum with oblique carina absent, lateral carina not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 3.13–3.63 mm; head length 1.16–1.19 mm; head width 1.18–1.23 mm; forewing length 2.81–3.09 mm.

Colouration. Labrum, mandible, and distal margin of clypeus brownish yellow. Flagellum with ventral surface brownish yellow. Tegula pale yellow. Legs brown, except tarsi and anteroventral portion of tibiae pale brownish yellow.

Pubescence. Face below eye emargination with moderately dense tomentum partially obscuring surface, denser on lower paraocular area. Metasomal sterna sparsely pubescent, S4–S5 with apicolateral tufts (1.5 OD).

Surface sculpture. Mesoscutum imbricate, punctation sparse between parapsidal lines (i=1–2.5d) and dense laterad of parapsidal line (i≤1d). Metapostnotum with longitudinal carinae, reaching posterior margin. Propodeal dorsolateral slope rugose. T2 apical impressed area impunctate.

Structure. Head wide (length/width ratio = 0.97–0.99). Eyes strongly convergent below (UOD/LOD ratio = 1.67–1.72). Clypeus 2/3 below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets distant (IAD/OAD > 1.5). Frontal line carinate, ending 1.5 OD below median ocellus. Pedicel shorter than F1. F2

length 1.7–1.8X F1. F2–F10 elongate (length/width ratio = 1.56–1.60). Metapostnotum moderately elongate (MMR ratio = 1.15–1.17), posterior margin sharply angled onto posterior propodeal surface.

Terminalia. Not examined.

Range. South-eastern USA. (Fig. 149). **USA**: FL, GA, MS.

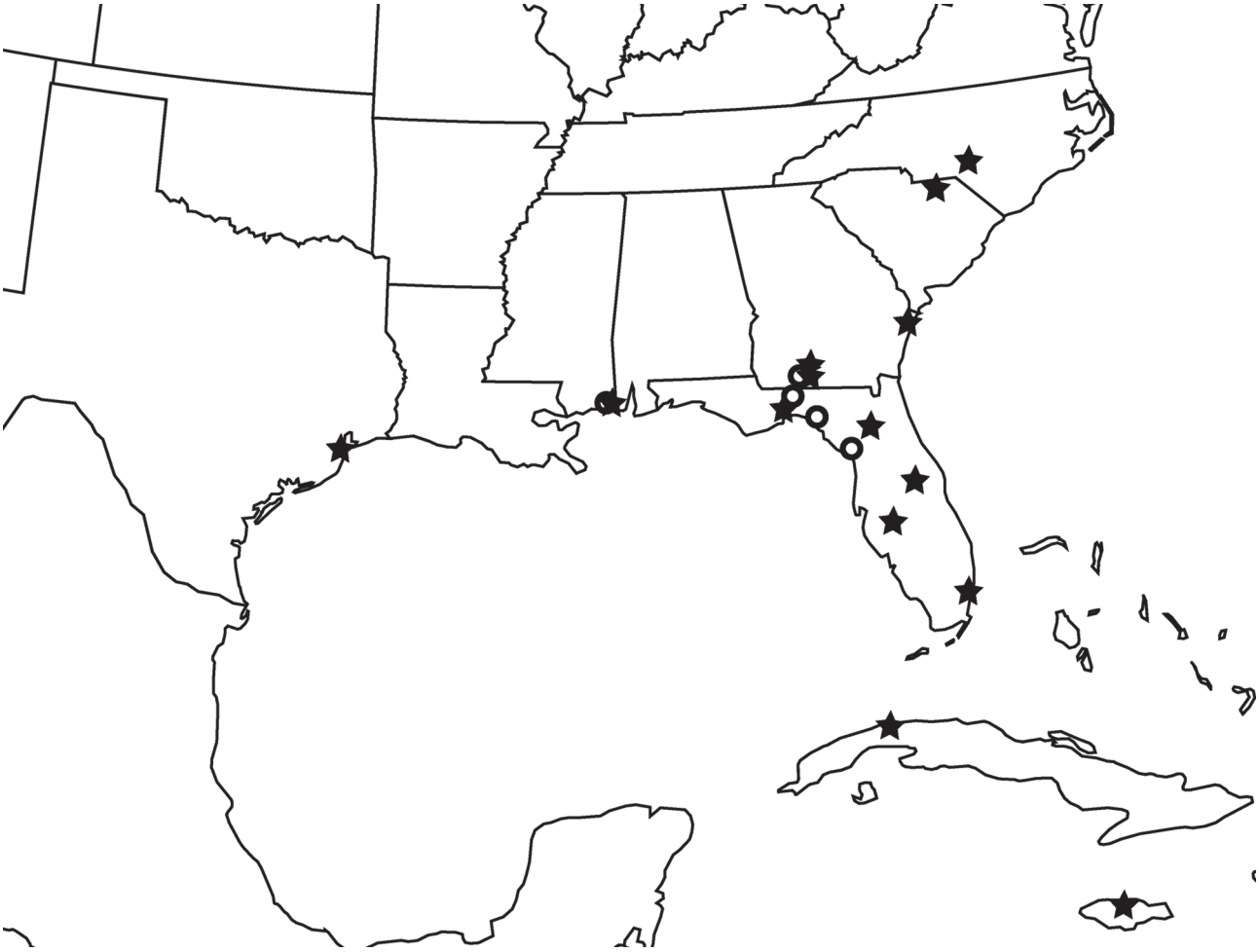

FIGURE 149. Distribution map of *Lasioglossum leviense* (circles) and *L. longifrons* (stars).

Additional material examined. USA: FLORIDA: 33♀♀3♂♂ Leon Co., Apalachicola National Forest, "ant heaven", N30.31687 W084.50008, 20–27.vi.2005 (Ronquist Lab); 6♀♀ Leon Co., Apalachicola National Forest, "ant heaven", N30.31687 W084.50008, 5–11.vii.2005 (Ronquist Lab), 23♀♀ Leon Co., Apalachicola National Forest, "ant heaven", N30.31687 W084.50008, 11–18.vii.2005 (Ronquist Lab); [AMNH]; 3♀♀ *paratypes* Levy Co., 13.ix.1955 (R.A. Morse); [CUIC]; 2♀♀ *paratypes* Levy Co., 13.ix.1955 (R.A. Morse); [NCSU]; 1♀ *paratype* Silver Springs, 5.iv.1953 (K.V. Krombein); [NMNH]; 2♀♀ Wakulla Co., Apalachicola N.F., FS 366, N30˚19.751′ W084˚30.309′, 8–15.v.2005 (Ronquist lab); 2 ♀♀ Wakulla Co., Apalachicola N.F., FS 366, N30˚19.751′ W084˚30.309′, 5–13.vi.2005 (Ronquist lab); 1♀ Wakulla Co., Apalachicola N.F., FS 366, N30˚19.751′ W084˚30.309′, 13–20.vi.2005 (Ronquist lab); 9♀♀ Wakulla Co., Apalachicola N.F., FS 366, N30˚19.751′ W084˚30.309′, 5–11.vii.2005 (Ronquist lab); 1♀ Wakulla Co., Apalachicola N.F., FS Rd. 390, N30˚21.696′ W084˚40.399′, 11–18.vii.2005 (Ronquist lab); 1♀ Wakulla Co., Apalachicola N.F., Post Office Bay, N30˚3.565′ W084˚59.051′, 13–20.vi.2005 (Ronquist lab); 1♀ Wakulla Co., Apalachicola N.F., Post Office Bay, N30˚3.565′ W084˚59.051′, 27.vi–5.vii.2005 (A. Vanderby); [PCYU]; 12♀♀ Taylor Co., Rt 98 & Ecolina Riv., 1.iv.1993 (S.M. Fullerton); [UCFC]; GEORGIA: 1♀ *paratype* Pine Park, 17.iii.1939 (P.W. Fattig); [NCSU]; MISSISSIPPI: 1♀ Hattiesburg, 2.vii.1944 (C.D. Michener); [AMNH]; 3♀♀ Jackson Co., N30.3957 W088.7939, 4–5.vi.2005 (S.W. Droege); [PCYU].

Floral records. APIACEAE: *Zizia*; POLYGONACEAE: *Polygonum hydropiperoides*.

DNA Barcode. Available. Multiple sequences. DNA barcodes of *L. leviense* show little to no difference from *L. mitchelli*.

Comments. Uncommon.

Lasioglossum (*Dialictus*) *lineatulum* (Crawford)

Halictus lineatulus Crawford 1906: 5. ♀.
Holotype. ♀ USA, Michigan, Ag. Coll., 5.x.1893 [10.v.1893] (R.H. Wolcott); [NMNH: 12071]. Examined.
Halictus subconnexus Ellis 1915: 291. ♀.
Holotype. USA, Wisconsin, Milwaukee, 29.v.1903 (S. Graenicher); [UCMC].
Halictus (*Chloralictus*) *latus* Sandhouse, 1924: 20. ♀.
Holotype. ♀ USA, Colorado, Colorado Springs, 20.iv., on willow (W.P. Cockerell), [NMNH: 26414]. Examined.
Halictus (*Chloralictus*) *unicus* Sandhouse, 1924: 21. ♀.
Holotype. ♀ USA, Iowa, Seven miles east of Vinton, 29.vi.1922 (G. Sandhouse), [NMNH: 26415]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *latum*, p. 1114, *L.* (*C.*) *lineatulum*, p. 1114 (catalogue, Timberlake synonymy); Mitchell, 1960: *Dialictus lineatulus* ♀♂, p. 403, *D. unicus* ♀♂, p. 425 (redescription);; Krombein, 1967: *Lasioglossum* (*Dialictus*) *lineatulum*, p. 464, *L.* (*D.*) *unicum*, p. 466 (catalogue); Hurd, 1979: *Dialictus latus*, p. 1967, *D. lineatulus*, p. 1968, *D. unicus*, p. 1972 (catalogue); Moure & Hurd, 1987: *Dialictus latus*, p. 110, *D. lineatulus*, p. 110, *D. unicus*, p. 136 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *lineatulum* ♀♂, p. 180 (redescription, key, synonymy).

Diagnosis. Female *L. lineatulum* can be recognised by the following diagnostic combination: head wide (length/width ratio = 0.92–0.93); clypeus weakly protruding below suborbital tangent; mesoscutal punctures sparse, including laterad of parapsidal lines (Fig. 4I); mesepisternum rugulose; propodeum with dorsolateral slopes smooth; (Figs. 2C, 27A) and metasomal terga often with metallic reflections. They are most similar to *L. novascotiae*, which has head longer (length/width ratio = 0.95–0.96), clypeus strongly protruding below suborbital tangent, propodeum with dorsolateral slopes rugulose (Fig. 27B), and metasomal terga without metallic reflections.

Male *L. lineatulum* can be recognised by the following diagnostic combination: mesoscutal punctures sparse laterad of the parapsidal lines, and S2–S4 and S5 laterally with dense plumose hairs. They are similar to *L. novascotiae* have subappressed plumose hairs limited to the apicolateral portions of S3 and lateral portions of S4–S5.

Range. Nova Scotia west to Alberta, south to Georgia. **USA**: CT, CO, GA, IA, MA, MD, ME, MI, MN, NC, NJ, NY, PA, VT, WI, WV. **CANADA**: AB, MB, ON, PQ, SK.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Lasioglossum lineatulum forms eusocial colonies (Eickwort 1986).

The location of the holotype of *Halictus subconnexus* was previously unknown. At the time of the original description Ellis was working from Boulder, Colorado so the type specimen was likely deposited at UCMC. A specimen was discovered at UCMC with identical locality information to the type specimen designated by Ellis (1915). The specimen has a label reading "*Halictus subconnexus* Ellis" in Ellis' handwriting. It is believed that this specimen is the original type. A type label has been affixed to the specimen.

Lasioglossum (*Dialictus*) *lionotum* (Sandhouse)

Dialictus lionotus Sandhouse, 1923: 194. ♂.
Holotype. ♂ USA, Colorado (Baker); [NMNH]. Examined.
Paralictus asteris Mitchell, 1960: 446. ♀ ♂. **[new synonymy]**
Holotype. ♀ USA, North Carolina, Cliffs of the Neuse State Park, Wayne Co., 21.x.1955; [NCSU].

Taxonomy. Michener, 1951: *Lasioglossum* (*Dialictus*) *lionotum*, p.1119; Krombein, 1967: *Lasioglossum* (*Paralictus*) *asteris*, p. 467 (catalogue); Hurd, 1979: *Dialictus lionotus*, p. 1968; *Paralictus asteris*, p. 1974 (catalogue); Moure & Hurd, 1987: *Dialictus lionotus*, p. 111; *Paralictus asteris*, p. 142 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *asteris* ♀♂, p. 69 (redescription, key).

Diagnosis. Female *L. lionotum* can be recognised by the following diagnostic combination: size small (4.0–4.6 mm); gena wider than eye; labrum flat, dorsal keel absent; mandible without preapical tooth; pronotal ridge sharply angled, dorsolateral angle acute to orthogonal; scopa absent; and metapostnotum smooth without evident rugae.

Male *L. lionotum* can be recognised by the following diagnostic combination: size small (4.2–4.5 mm; head width 1.15–1.22 mm); lower paraocular area with sparse tomentum; antennal sockets very widely separated (IAD/OAD > 2.0);

pronotal collar strong; mesepisternum imbricate, obscurely punctate; and vein 1rs-m sometimes incomplete or absent. They are most similar to the male of *L. cephalotes*, which is much larger in size (head width 1.54 mm).

Range. Ontario south to Alabama, west to Colorado. **USA**: AL, CO, DC, KS, MD, MO, NJ, NY, SC, VA, WV. **CANADA**: ON.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon.

Lasioglossum lionotum is a social parasite of *L. imitatum* (Wcislo 1997; as *Paralictus asteris*).

The holotype of *L. lionotum* was recently found in the research collection of George Eickwort at Cornell University. The head is missing but the specimen clearly matches the species commonly known as *L. asteris*. The original description includes few details about the head but does draw attention to the unusually short eyes which is consistent with *L. asteris*.

Lasioglossum (*Dialictus*) *longifrons* (Baker)

(Figures 150–154)

Halictus longiceps Robertson, 1892: 272. ♀. (junior primary homonym of *Halictus longiceps* Saunders, 1879)
Lectotype. ♀ USA, Florida, Inverness, 12.ii.1891 (C. Robertson); [INHS: 9993] by W. E. LaBerge in Webb 1980). Examined.

Halictus longifrons Baker. 1906: 269. ♀. **[new synonymy]**
Holotype. Unknown.

Lasioglossum (*Chloralictus*) *robertsonellum* Michener, 1951: 1117. (catalogue, replacement name for *H. longiceps* Robertson)

Taxonomy. Graenicher, 1927: *Halictus* (*Chloralictus*) *longiceps* 206. ♂. (description).

Diagnosis. Both sexes of *L. longifrons* can be recognised by the following diagnostic combination: head very long (length/width ratio = 1.18–1.21) (Figs. 150B, 152B); mesoscutum strongly tessellate, punctures sparse (i=1–2.5d) (Figs. 151, 153), except closer laterad of parapsidal line; and females have T1 acarinarial fan sparse dorsally or with dorsal opening (Fig. 151). They are most similar to *L. coreopsis*, which has a shorter head (length/width ratio = 1.09–1.13) (Figs. 79B, 81B) and T1 acarinarial fan dense dorsally.

Redescription. FEMALE. Length 3.75–4.42 mm; head length 1.22–1.44 mm; head width 1.01–1.20 mm; forewing length 2.60–3.27 mm.

Colouration. Head and mesosoma golden green to bluish green. Clypeus with apical half blackish brown to yellowish brown. Antenna dark brown, flagellum with ventral surface brownish orange to orange-yellow. Tegula brownish yellow. Wings subhyaline, venation and pterostigma pale brownish yellow. Legs brown, except medio- and distitarsi reddish brown to brownish yellow, metabasitarsus infused with reddish brown. Metasomal terga and sterna golden brown, apical margins pale, translucent yellow.

FIGURE 150. *Lasioglossum longifrons* (Baker) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Pubescence. Dull white. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena with sparse subappressed tomentum. Propo-

deum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately sparse, fine hairs. T1 acarinarial fan complete, sparse dorsally or with dorsal opening. T2 basolaterally with sparse tomentum. T3–T5 with sparse tomentum not obscuring surface. T2–T4 apical margins with moderately dense fringes.

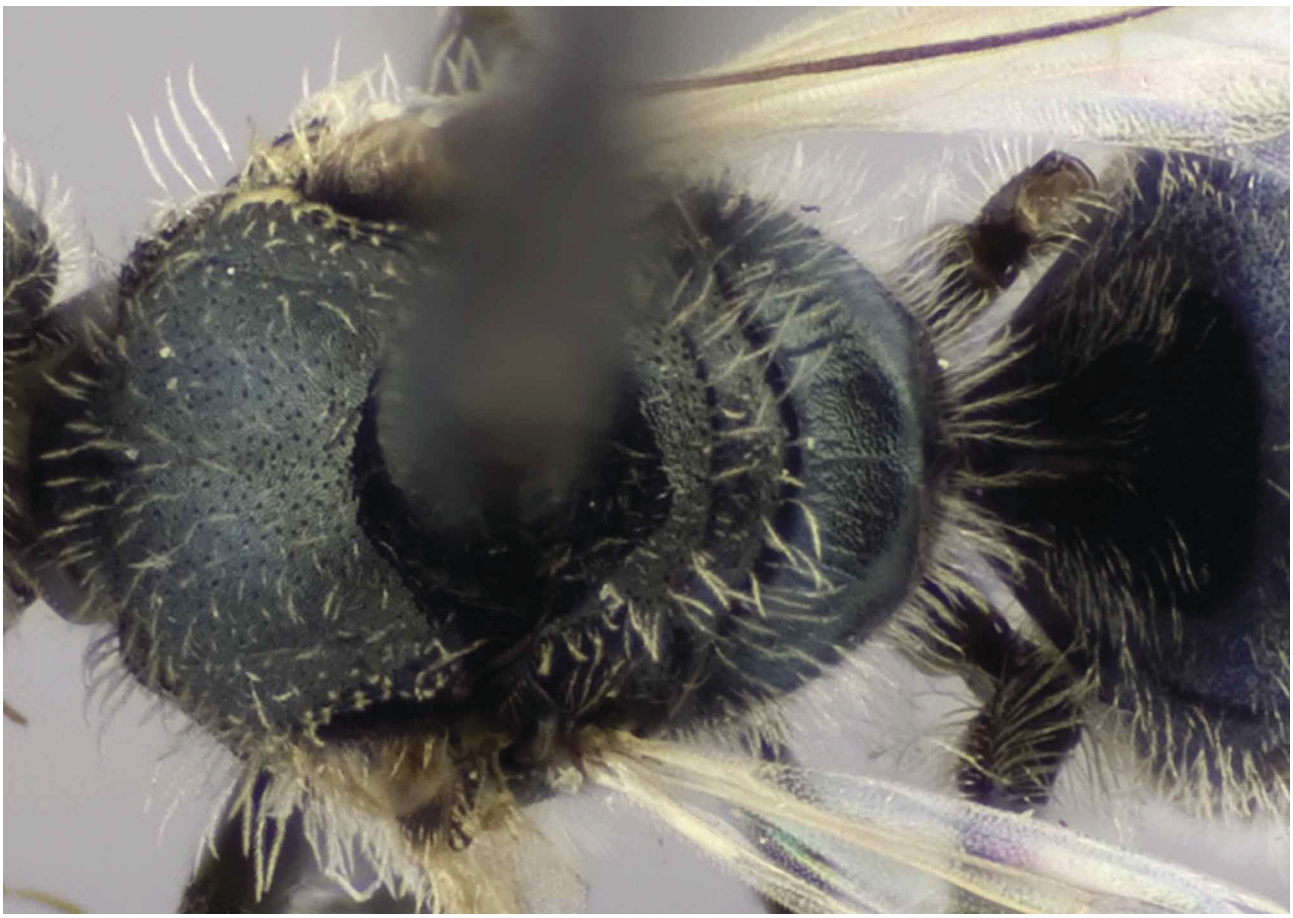

FIGURE 151. *Lasioglossum longifrons* (Baker) female, dorsal view of mesosoma.

Surface sculpture. Face imbricate, punctation fine. Clypeus punctation (i=1–2.5d). Supraclypeal area with punctation moderately dense (i=1–3d). Lower paraocular and antennocular areas with punctation dense (i≤d). Upper paraocular area and frons punctate-reticulate. Ocellocular area obscurely punctate (i≤d). Gena and postgena lineolate. Mesoscutum coarsely tessellate-granulose, punctation sparse on disc (i=1–2.5d), denser laterad of parapsidal line and on anterolateral portion (i=1–1.5d). Mesoscutellum tessellate, submedial punctation sparse (i=1–4d). Axilla punctate. Metanotum imbricate. Preëpisternum rugulose-imbricate. Hypoepimeral area tessellate-imbricate. Mesepisternum rugulose-imbricate. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum weakly rugoso-carinulate, posterior margin imbricate. Propodeum with dorsolateral slope imbricate, lateral surface tessellate-imbricate, posterior surface tessellate. Metasomal terga weakly coriarious, punctation moderately dense basally (i=1–1.5d), apical impressed areas obscurely, sparsely punctate.

Structure. Head elongate (length/width ratio = 1.20–1.21). Eyes convergent below (UOD/LOD ratio = 1.39–1.48). Clypeus ½ below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2.5–3 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum truncate (MMR ratio = 1.22–1.38), posterior margin rounded onto posterior surface. Propodeum with oblique carina very fine or absent, lateral carina fine, reaching less than halfway to dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 5.26 mm; head length 1.61 mm; head width 1.37 mm; forewing length 3.39 mm.

Colouration. Labrum and mandible yellow. Legs brown, except tarsi brownish yellow.

Pubescence. Face below eye emargination obscured by dense tomentum. Metasomal terga with sparse tomentum. S3–S5 with lateral patches of posteriorly directed hairs (1–1.5 OD).

FIGURE 152. *Lasioglossum longifrons* (Baker) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Surface sculpture. Mesepisternum finely punctate. Metasomal terga punctation moderately dense (i=1–1.5d), apical impressed areas impunctate.

Structure. Head very elongate (length/width ratio = 1.18). Eyes strongly convergent below (UOD/LOD ratio = 1.42). Clypeus 2/3 below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets distant (IAD/OAD > 0.8). Frontal line carinate, ending 2 OD below median ocellus. Pedicel shorter than F1. F2 length 1.5X F1. F2–F10 moderately short (length/width ratio = 1.27–1.60). Metapostnotum truncate (MMR ratio = 1.40), posterior margin rounded onto posterior surface.

Terminalia. S7 with median lobe clavate, apex rounded (Fig. 154). S8 with apicomedial margin weakly convex (Fig. 154). Genital capsule as in Fig. 154. Gonobase with ventral arms widely separated. Volsella roughly ovoid. Gonostylus elongate, dorsal setae elongate. Retrorse lobe elongate, apex reflexed, strongly attenuated apically.

Range. Florida north to South Carolina, west to Texas (Fig. 149). **CUBA**. **JAMAICA**. **USA**: FL, GA, MS, NC, SC, TX.

Additional specimens examined. CUBA: 1♀1♂ Havana (Baker); [AMNH]; **JAMAICA:** 4♀♀ St. Ann Parish, Claremont, 12.viii.1985 (G.C. Eickwort); [CUIC]; **USA:** FLORIDA: 1♀ Hardee Co., 4.v.1930 (J.M. Kelly); [CUIC]; 1♀ Coral Gables, 11.xii.1934 (?J. Pearson); [INHS];1♀ Alachua Co., N29.6425 W082.5639, 18–19.x.2007 (C. Puckett); 1♀ Homestead, Miami, 30.viii.2006 (J. Genaro); [PCYU]; GEORGIA: 1♀ Pavo, N30.941 W083.708, 21.vi.2005 (A. Zayed); [PCYU]; 1♀ Bryan Co., Richmond Hill St. Pk., 2.v.1974 (G.C. Eickwort); [CUIC]; MISSISSIPPI: 1♀ Jackson Co., N30.3657 W088.7325, 4–5.vi.2005 (S.W. Droege); 2♀♀ Jackson Co., N30.3957 W088.7552, 4–5.vi.2005 (S.W. Droege); [PCYU]; NORTH CAROLINA: 1♀ Southern Pines, ?9.xii.19? (A.H. Manee); [UCMC]; SOUTH CAROLINA: 1♀ Chesterfield Co., N34.5789 W080.23341, 18.v.2006 (S.W. Droege); [PCYU]; TEXAS: 1♂ Galveston, 19.v; [PCYU].

Floral Records. Mainland populations of this species were formerly treated as a junior synonym of *L. coreopsis*. Some of the floral records for that species may be applicable to *L. longifrons*.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Eickwort (1988) first recognised the synonymy of *L. longifrons* with *L. robertsonellum* (see also Deyrup *et al*. 2002) but at that time the latter name was considered a junior synonym of *L. coreopsis* (see Mitchell 1960), which has priority over *L. longifrons*. The head sizes of *L. longifrons* and *L. coreopsis* are quite different and DNA barcodes of the two species differ substantially (J. Gibbs unpublished data). Morphological comparison of West Indian and Floridian material failed to find any differences between the two populations. Other halictine bees, such as *L. eleutherense*, *L. halophitum*, and *Halictus poeyi* (Lepeletier), also have distributions that include both the West Indies and the continental United States. It is certainly possible that additional study will prove that the West Indian and Floridian populations constitute separate species, in which case the name *L. robertsonellum* should be used for the mainland population.

FIGURE 153. *Lasioglossum longifrons* (Baker). Maale dorsal view of mesosoma.

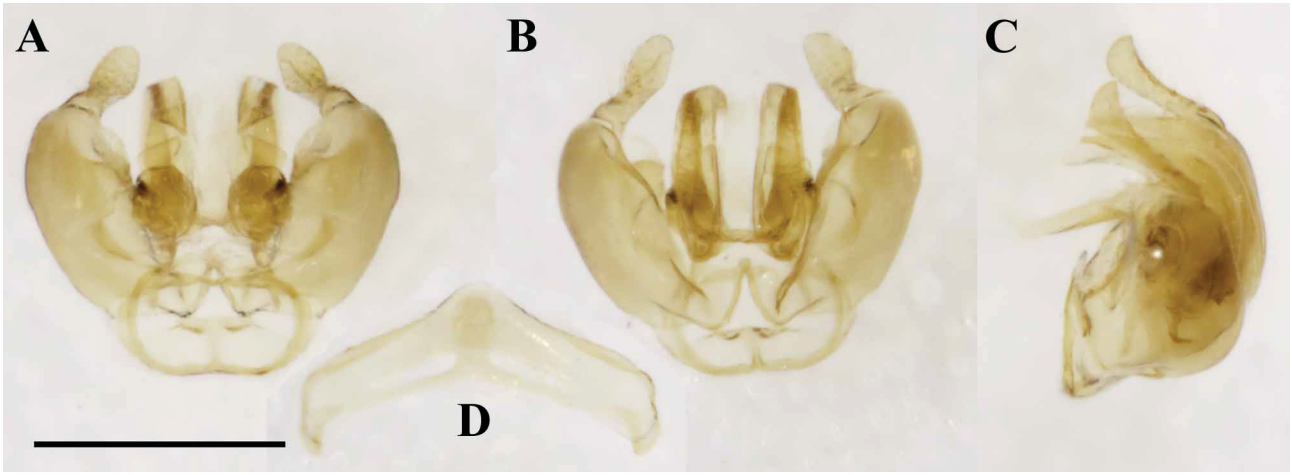

FIGURE 154. *Lasioglossum longifrons* (Baker) male terminalia, (A) ventral view, (B) dorsal view, (C) lateral view, (D) S7 and S8. Scale bar = 0.5 mm.

Lasioglossum (*Dialictus*) *marinum* (Crawford)

(Figures 155–158)

Halictus marinus Crawford, 1904: 99. ♀.

Holotype. ♀ USA, New Jersey, Ocean City, 10.vi.1901; [ANSP].

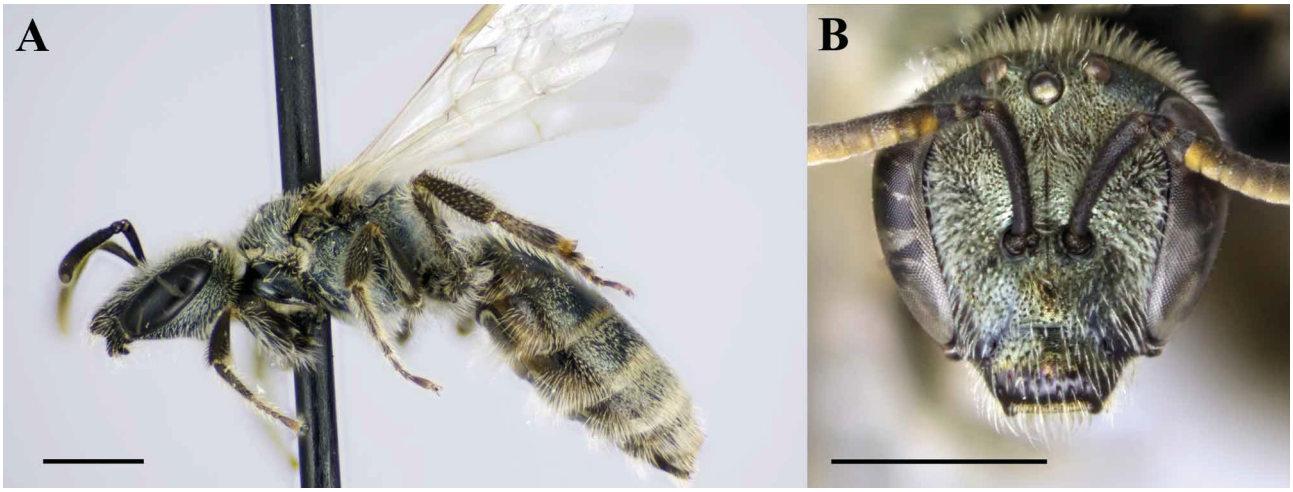

FIGURE 155. *Lasioglossum marinum* (Crawford) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Taxonomy. *Halictus* (*Chloralictus*) *marinus* ♂ Graenicher, 1927: 203 (description); *Halictus* (*Chloralictus*) *marinus* Graenicher, 1930: 156 (tax. notes). Michener, 1951: *Lasioglossum* (*Chloralictus*) *marinum*, p. 1115 (catalogue); Mitchell, 1960: *Dialicutus marinus*, p. 404 (redescription, key, *lapsus calami*); Krombein, 1967: *Lasioglossum* (*Dialictus*) *marinum*, p. 464 (catalogue); Moure and Hurd, 1987: *Dialictus marinus*, p. 112 (catalogue).

Diagnosis. Both sexes of *L. marinum* can be recognised by the following diagnostic combination: tegula enlarged, distinctly punctate with strong posterior angle (Fig. 156), and metasomal terga with metallic reflections.

Description. FEMALE. Length 5.81–6.05 mm; head length 1.74–1.90 mm; head width 1.74–1.80 mm; forewing length 4.17–4.30 mm.

Colouration. Head and mesosoma pale blue with green and golden reflections. Clypeus with apical half blackish brown, basal half, and supraclypeal area bronze. Antenna dark brown, flagellum with ventral surface brownish yellow-orange. Tegula dark reddish brown, translucent yellow anteriorly. Wing membrane hyaline, venation and pterostigma pale brownish yellow. Legs brown, except medio- and distitarsi reddish. Metasomal terga faintly metallic green, sterna brown, apical impressed areas amber to pale translucent yellow.

Pubescence. Dull white. Moderately dense. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Lower paraocular area, frons and gena with sparse, subappressed tomentum, partially obscuring surface. Metanotum obscured posteriorly by tomentum. Metepisternum obscured by tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately sparse, fine hairs. T1 acarinarial fan dense, complete dorsally. T1 dorsolateral portion with small patch of appressed tomentum. T2 basolaterally, T3 basally and T4–T5 entirely with tomentum. T2 apicolaterally and T3–T4 apically with relatively dense fringes.

Surface sculpture. Face weakly imbricate. Clypeus with apical half polished, punctation irregularly spaced (i=1–2.5d). Supraclypeal area with punctation dense (i≤d). Lower paraocular area and antennocular area punctation dense (i≤d). Upper paraocular area and frons punctate-reticulate. Ocellocular area minutely punctate (i≤d). Gena and postgena lineolate. Mesoscutum polished, punctation relatively dense on centre of disc (i≤d), sparser posteriorly (i=1–1.5d), contiguous laterad of parapsidal line (i≤d), and subreticulate on anterolateral portion. Mesoscutellum polished, submedial punctation moderately sparse (i=1–2d). Tegula coarsely punctate. Preëpisternum reticulate-punctate. Hypoepimeral area reticulate-punctate. Mesepisternum polished, coarsely punctate anteriorly (i≤d), finely punctate posteriorly. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum rugoso-carinulate. Propodeum dorsolateral slope carinulate, lateral and posterior surfaces imbricate-tessellate. Metasomal terga polished except T1 anterior declivitous surface and apical impressed areas coriarious, punctation on basal halves moderately dense (i=1–1.5d), sparser on apical halves (i=2–3d).

Structure. Head round (length/width ratio = 1.00–1.03). Eyes convergent below (UOD/LOD ratio = 1.20–1.21). Clypeus below 2/3–3/4 suborbital tangent, apicolateral margins convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2 OD below median ocellus. Gena narrower than eye. Tegula elongate with distinct posterior angle. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum truncate (MMR ratio = 1.45–1.56), posterior

margin narrowly rounded onto posterior surface. Propodeum with oblique carina very weak, lateral carina weak, not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 5.02–5.63 mm; head length 1.54–1.56 mm; head width 1.51 mm; forewing length 3.81–3.93 mm.

Colouration. Flagellum with ventral surface orange-yellow. Legs brown, except tarsi brownish yellow.

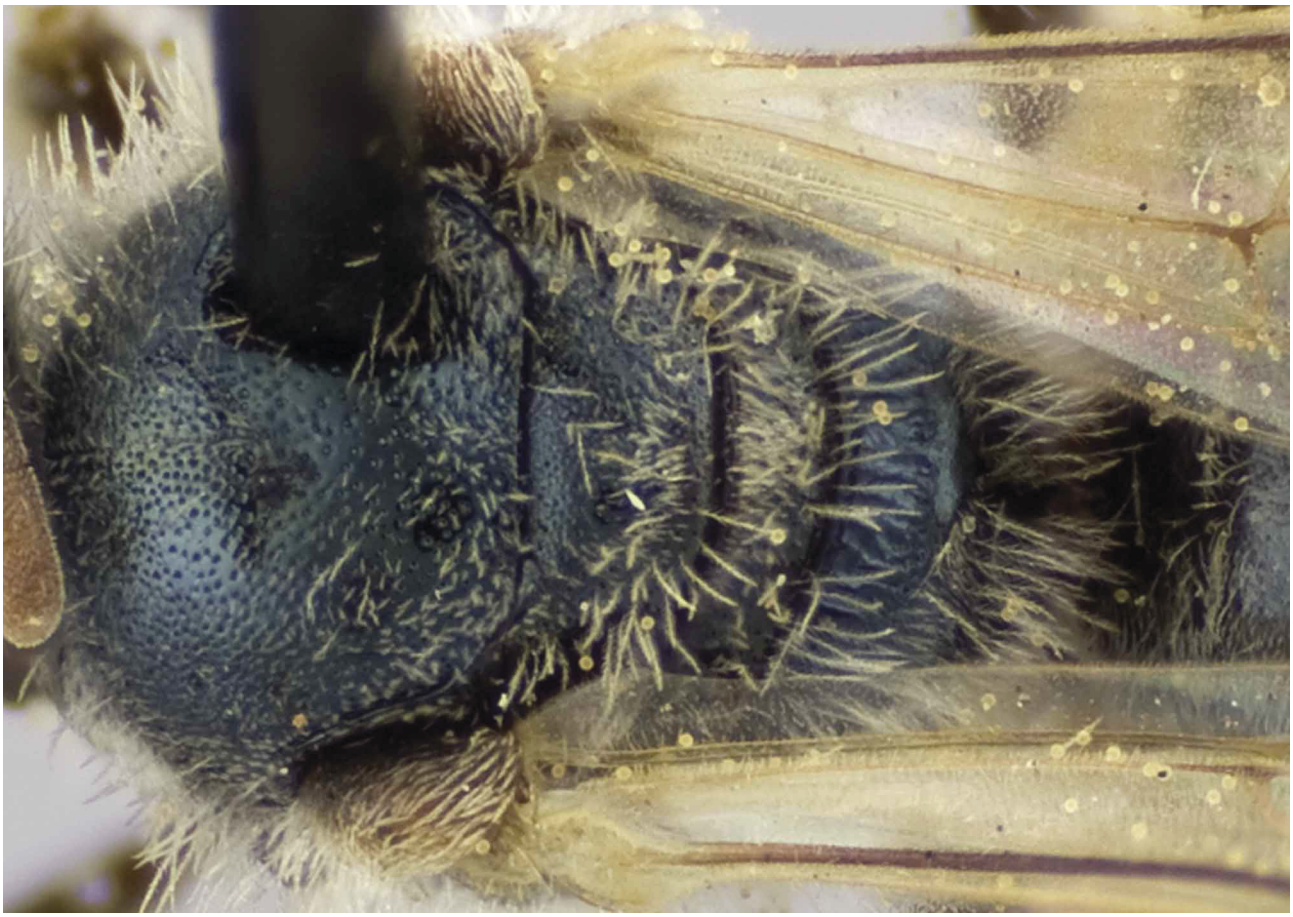

FIGURE 156. *Lasioglossum marinum* (Crawford) female, dorsal view of mesosoma.

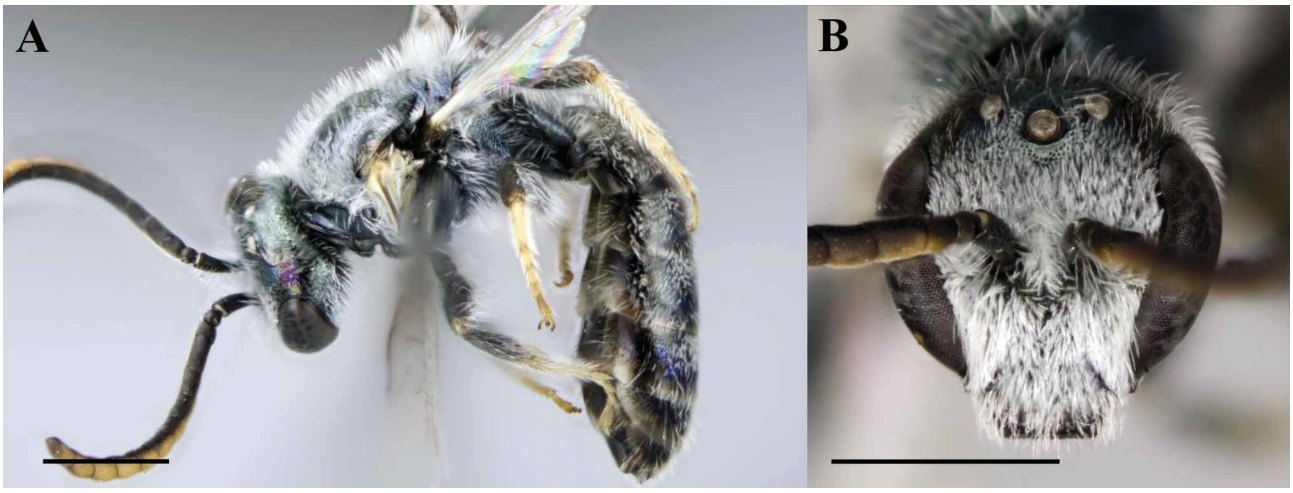

FIGURE 157. *Lasioglossum marinum* (Crawford) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Pubescence. Face below supraorbital line obscured by dense tomentum. Mesoscutal margins with tomentum. T1–T5 with sparser tomentum. S2–S5 apicolaterally with very sparse plumose hairs (1 OD).

Surface sculpture. Gena polished, postgena lineolate. Mesoscutum punctation sparser between parapsidal lines (i=1–1.5d). Mesepisternum polished, punctation distinct. Metapostnotum posterior margin imbricate. Propodeum with dorsolateral slope punctate (i≤d), lateral surface ruguloso-imbricate.

Structure. Head elongate (length/width ratio = 1.02–1.03). Eyes convergent below (UOD/LOD ratio = 1.41). Antennal sockets distant (IAD/OAD > 1.2). Pedicel shorter than F1. F2 length 1.5–1.6X F1. F2–F10 moderately short (length/width ratio = 1.29–1.50). Metapostnotum truncate (MMR ratio = 1.45–1.50), posterior margin rounded onto posterior surface.

Terminalia. S7 with median lobe clavate apex rounded (Fig. 158). S8 with apicomedial margin weakly convex (Fig. 158). Genital capsule as in Fig. 158. Gonobase with ventral arms broadly separated. Volsella roughly ovoid. Gonostylus small, dorsal setae elongate. Retrorse lobe elongate, roughly parallel sided, weakly attenuated apically.

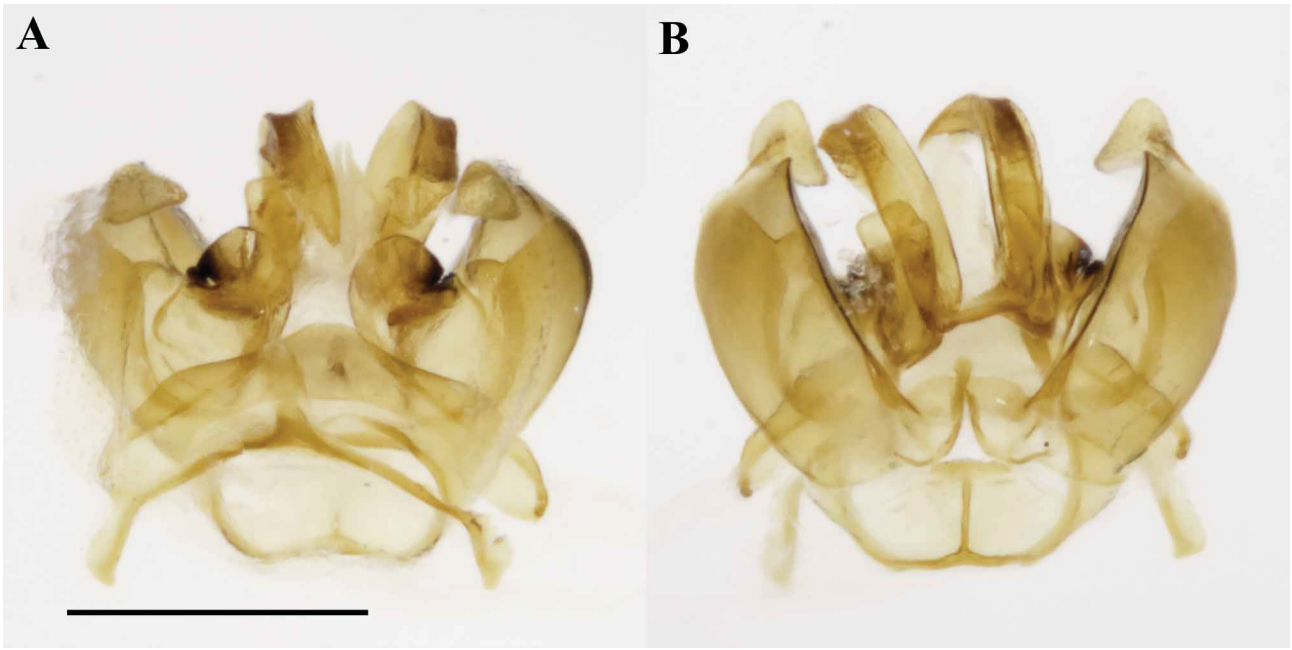

FIGURE 158. *Lasioglossum marinum* (Crawford) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

Range. Coastal sand dunes from Alabama, Florida to Massachusetts (Fig. 159). **USA**: AL, FL, NC, NJ, NY, VA.

Additional specimens examined. USA: ALABAMA: 1♀1♂ Baldwin Co., Ft. Morgan S.P., T9S R1E Sec. 1,2, 15.x.1991 (G.C. Eickwort); 1♂ Baldwin Co., Bon Secour N.W. Ref., T9S R2E Sec. 25 S, 12.x.1991 (G.C. Eickwort); 1♀ Miami, 2.i.1925 (S. Graenicher); 1♀ 22.x.1927 (S. Graenicher); 1♀ golden beach, Miami, 23.iv.1927 (S. Graenicher); [CUIC]; FLORIDA: 2♀♀1♂ Duval Co., Little Talbot Island S.P., 1.v.1974 (G.C. Eickwort); [CUIC]; NEW JERSEY: 1♀ Ocean Co., Lakehurst, Clayton Mines, 16.vii.1996 (M.E. Yurlina); [AMNH]; 1♀1♂ Corson's Inlet, 26.vii.1923 (J.C. Bradley); [CUIC]; NEW YORK: 1♀1♂ Suffolk Co., N41.02621 W071.9633, 7.ix.2005 (S.W. Droege); 1♀ Suffolk Co., N41.03537 W071.1363, 7.ix.2005 (S.W. Droege); 1♂ Suffolk Co., N41.1279 W071.2716, 8.ix.2005 (S.W. Droege); [PCYU]; NORTH CAROLINA: 1♀ Kill Devil Hills, 4.viii.1962 (K.V. Krombein); [CUIC]; 1♀ Kill Devil Hills, 8.ix.1956 (T.B. Mitchell); [NCSU]; 1♀ Dare Co., N36.0306 N075.6764, 13.vii.2006 (E. Soderholm); [PCYU]; VIRGINIA: 5♀♀ Assateague I., N37.9808 W075.2808, 30.vi–1.vii.2006 (S.W. Droege); 1♀ Assateague I., N37.8815 W075.3461, 1–2.vii.2006 (S.W. Droege); [PCYU].

Floral records. AMARANTHACEAE: *Alternanthera flavescens*; ASTERACEAE: *Bidens*, *Chrysopsis falcata*, *Helianthus debilis*; VITACEAE: *Parthenocissus*.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon. *Lasioglossum marinum* is a sand dune specialist only collected on the coast of the eastern United States from Alabama to New York. This species shows affinities to other presumed sand dune specialists in North America, such as *L. sheffieldi* and *L. yukonae*, both of which have a slightly elongate tegula (Gibbs 2010b). The enlarged tegula of *L. marinum* is similar to those of the *L. tegulare* species-group but *L. marinum* is only distantly related (Gibbs 2009a).

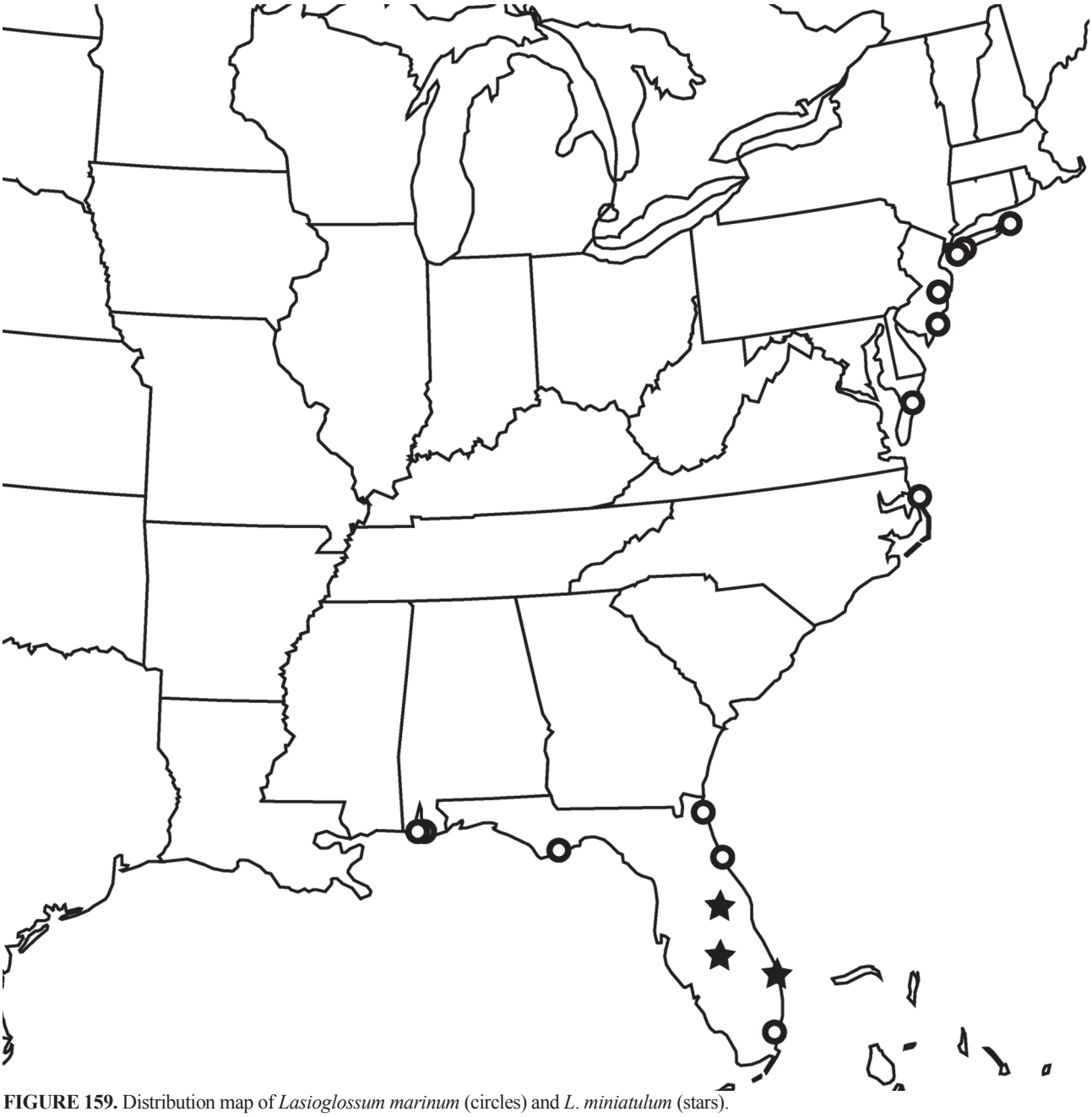

FIGURE 159. Distribution map of *Lasioglossum marinum* (circles) and *L. miniatulum* (stars).

Lasioglossum (*Dialictus*) *michiganense* (Mitchell)

Paralictus michiganensis Mitchell, 1960: 448. ♀.

Holotype. ♀ USA, Michigan, Wayne Co., 2.vi.1940, [NCSU].

Taxonomy. Krombein, 1967: *Lasioglossum* (*Paralictus*) *michiganense*, p. 467; (catalogue); Hurd, 1979: *Paralictus michiganensis*, p. 1974 (catalogue); Moure & Hurd, 1987: *Paralictus michiganensis*, p. 143 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *michiganense* ♀♂, p. 191 (redescription, key).

Diagnosis. Female *L. michiganense* can be recognised by the following diagnostic combination: head wide (length/width ratio = 0.84–0.85); labrum with apical process flat, dorsal keel absent (Fig. 6B); mandible with preapical tooth present (Fig. 30B); gena wider than eye; and mesepisternum with vertical carinula.

Male *L. michiganense* can be recognised by the following diagnostic combination: pronotum strongly carinulate; mesoscutum with weak microsculpture, punctures fine, sparse between parapsidal lines; metasomal sterna with very sparse hairs; and S7 median lobe clavate. They are most similar to *L. platyparium*, which has S7 median lobe acuminate.

Range. Southern Ontario south to North Carolina, west to Wisconsin. **USA**: DC, IL, MI, NC, NY. **CANADA**: ON.
DNA Barcode. Available. Multiple sequences.
Comments. Rare.

Lasioglossum michiganense is presumed to be a social parasite or cleptoparasite of nest-building *Lasioglossum* (*Dialictus*).

Lasioglossum (*Dialictus*) *miniatulum* (Mitchell)

(Figures 160–163)

Dialictus miniatulus Mitchell, 1960: 405. ♀.
Holotype. ♀ USA, Florida, Jacksonville Beach, 5.viii.1946 [NCSU]. Examined.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *miniatulum*, p. 464 (catalogue); Hurd, 1979: *Dialictus miniatulus*, p. 1968 (catalogue); Moure and Hurd, 1987: *Dialictus miniatulus*, p. 113 (catalogue)

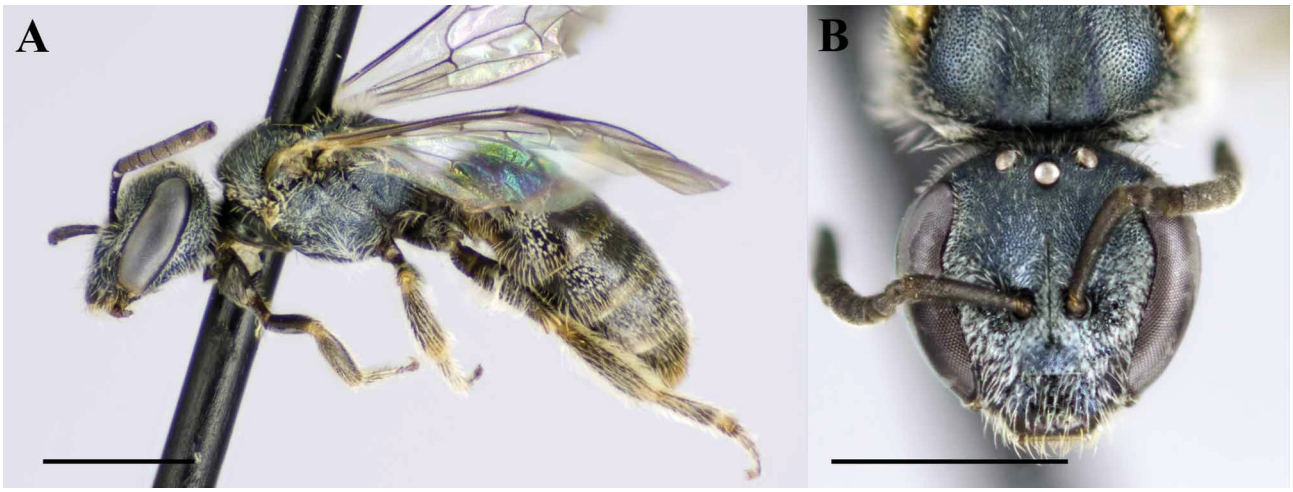

FIGURE 160. *Lasioglossum miniatulum* (Mitchell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 161. *Lasioglossum miniatulum* (Mitchell). Female dorsal view of mesoscutum.

Diagnosis. Female *L. miniatulum* can be recognised by the following diagnostic combination: head and mesosoma bluish; head wide to round (length/width ratio = 0.96–0.99); postgena lineolate; mesoscutal punctures dense throughout (i<d) (Fig. 161); mesepisternum punctate; T1 acarinarial fan without dorsal opening; and metasomal terga brown, T3 with moderately dense tomentum (Fig. 160A). They are superficially similar to *L. perpunctatum*, which has head and mesosoma greenish, postgena glabrate, and dense tomentum on T3.

Male *L. miniatulum* can be recognised by the following diagnostic combination: head round (length/width ratio = 1.00) (Fig. 162B); pronotal ridge broadly rounded; parapsidal line narrow (Fig. 163); mesepisternum with punctation distinct, dense; tegula ovoid; tarsi brownish yellow; metasomal terga brown, except posterior margins reddish; T2–T3 without tomentum; T2 apical impressed area distinctly punctate; and sternal pubescence short (1OD). They are most similar to *L. arantium* which have sparse basolateral tomentum on T2–T3 and have pale green mesoscutal integument.

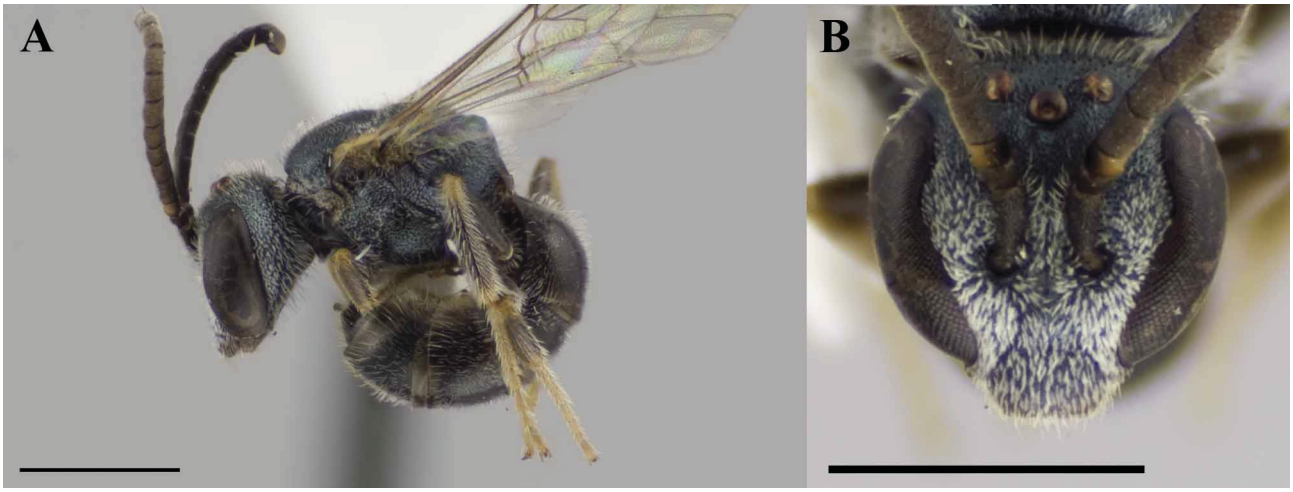

FIGURE 162. *Lasioglossum miniatulum* (Mitchell) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Redescription. FEMALE. Length 4.41–5.02 mm; head length 1.32 mm; head width 1.37 mm; forewing length 3.09–3.33 mm.

Colouration. Head and mesosoma pale blue. Labrum and mandible reddish brown to yellow. Clypeus with apical half blackish brown. Antenna dark brown, flagellum with ventral surface brown to reddish brown. Tegula pale yellow. Wing membrane subhyaline, venation and pterostigma yellowish brown. Legs brown, except tibial bases and apices, medio- and distitarsi, and sometimes protibia and basitarsi reddish to brownish yellow. Metasoma terga blackish brown, T1–T2 with some reddish tints anteriorly, terga and sterna with apical margins translucent yellow.

Pubescence. Dull white. Moderately dense. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Lower paraocular area and gena with subappressed tomentum, not obscuring surface. Mesoscutum lateral margins and mesepisternum dorsally with tomentum. Metepisternum obscured by tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately dense, fine hairs. T1 acarinarial fan complete (obscure on pale background). T1 apicolaterally, T2–T3 basally and laterally, and T4 throughout with moderately dense tomentum partially obscuring surface. T2 apicolateral and T3–T4 apical margins with relatively dense fringes.

Surface sculpture. Face imbricate, punctation moderately strong. Clypeus with apical half polished, punctation moderately sparse (i=1–1.5d). Supraclypeal area with punctation moderately sparse (i=1–1.5d). Lower paraocular area and antennocular area punctation dense (i≤d). Upper paraocular area, frons and ocellocular area punctate-reticulate. Gena and postgena lineolate. Mesoscutum weakly imbricate, polished submedially, punctation dense between parapsidal lines (i≤d), contiguous laterad of parapsidal line and punctate-reticulate on anterolateral portion. Mesoscutellum polished, submedial punctation sparse (i=1–2d). Axilla punctate. Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate-punctate. Mesepisternum rugulose-punctate (i≤d), smoother below. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum with anastomosing rugae nearly reaching posterior margin. Propodeum with dorsolateral slope and lateral surface rugulose-imbricate, posterior surface tessellate. Metasomal terga polished, punctation distinct throughout, close on basal halves (i=1–1.5d), more widely spaced on marginal zone (i=1–2d).

Structure. Head wide (length/width ratio = 0.96–0.99). Eyes convergent below (UOD/LOD ratio = 1.25–1.27). Clypeus 1/2 below suborbital tangent, apicolateral margins strongly convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2–2.5 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum moderately elongate (MMR ratio = 1.19–1.35), posterior margin rounded onto posterior surface. Propodeum with oblique carina obscure, lateral carina weak, not reaching dorsal margin.

FIGURE 163. *Lasioglossum miniatulum* (Mitchell) male, dorsal view of mesosoma.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 3.90 mm; head length 1.13 mm; head width 1.13 mm; forewing length 2.81 mm.

Colouration. Mandible yellow on apical half. Flagellum with ventral surface reddish brown. Pterostigma yellowish brown. Legs brown, except bases and apices of tibiae, and tarsi brownish yellow. Metasomal terga brown, apical impressed areas reddish brown.

Pubescence. Face below eye emargination with scattered tomentum partially obscuring surface, dense on lower paraocular area.

Surface sculpture. Mesoscutal punctation between parapsidal line relatively sparse (i=1–1.5d). Mesepisternum distinctly punctate

Structure. Head wide (length/width ratio = 1.00). Eyes strongly convergent below (UOD/LOD ratio = 1.71). Clypeus 1/2 below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets distant (IAD/OAD > 1.4). Frontal line carinate, ending 1.5 OD below median ocellus. Pedicel shorter than F1. F2 length 1.6X F1. F2–F10 moderately elongate (length/width ratio = 1.44–1.67). Metapostnotum elongate (MMR ratio = 1.22), posterior margin rounded onto posterior propodeal surface.

Terminalia. Not examined.

Range. Coastal areas of Florida (Fig. 159).

Additional material examined. USA: FLORIDA: 2♀♀ *paratypes* Jacksonville Beach, 5.viii.1936 (T.B. Mitchell); 1♀ *paratype* Jacksonville Beach, 20.viii.1937 (T.B. Mitchell); [CUIC]; 1♀ *paratype* Jacksonville Beach, 5.viii.1936 (T.B. Mitchell); [NMNH]; 25♀♀ Martin Co., N27.0072 W080.1015, 4.vi.2007 (S.W. Droege); 7♀♀ Martin Co., N27.0125 W080.1028, 4.vi.2007 (S.W. Droege); [PCYU]; 3♀♀ Highland Co., Lake Placid, Archbold Biol. Stn., 8–14.ix.1987 (BRC Hym. Team); 2♀♀ Highland Co., Lake Placid, Archbold Biol. Stn., 15–21.ix.1987 (BRC Hym. Team); [CNC]; 1♀ Orange Co., Orlando, 12.ix.1992 (S.M. Fullerton); 2♀♀ Orange Co., Orlando, 19.x.1993 (S.M. Fullerton); [UCFC].

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon. For additional comments see *L. arantium* (above).

Lasioglossum (*Dialictus*) *mitchelli* Gibbs

Dialictus atlanticus Mitchell, 1960: 383. ♀. (junior secondary homonym of *Halictus interruptus atlanticus* Cockerell, 1938b)

Holotype. ♀ USA, North Carolina, Raleigh, 5.viii.1957 (Mitchell); [NCSU]. Examined.

Lasioglossum (*Dialictus*) *mitchelli* Gibbs, 2010b: 194. ♀♂. (redescription, replacement name for *D. atlanticus* Mitchell).

Taxonomy. Knerer and Atwood, 1966a: *Dialictus atlanticus* ♂, p. 881 (description); Krombein, 1967: *Lasioglossum* (*Dialictus*) *atlanticum*, p. 462 (catalogue); Hurd, 1979: *Dialictus atlanticus*, p. 1964 (catalogue); Moure & Hurd, 1987: *Dialictus atlanticus*, p. 91 (catalogue).

Diagnosis. Female *L. mitchelli* can be recognised by the shape of the clypeus, which has the distal margin beyond the preapical fimbriae extending laterally making it noticeably wider than the preapical margin (Fig. 21B). The distal portion of the clypeus has a rectangular appearance as a result. They may be further distinguished by the combination of head wide (length/width ratio = 0.90–0.94); mesoscutum tessellate, punctures moderately dense between parapsidal lines (i=1–1.5d); mesepisternum rugulose; tegula pale straw; T1 declivitous surface with distinct, coriarious microsculpture, and acarinarial fan usually without dorsal opening. They are similar to some members of the *L. viridatum* species-group such as *L. paradmirandum*. Females of the *L. viridatum* species-group have the clypeus distinctly convergent towards the apex, T1 is often polished and the acarinarial fan usually has a distinct dorsal opening.

Male *L. mitchelli* are similar to females but have a more elongate head length/width ratio = 0.98–1.00) and may be further distinguished by flagellomeres elongate (length/width ratio = 1.73–1.90), tarsi and tibial apices brownish yellow, metapostnotum with posterior margin weakly carinate, and apical impressed areas of metasomal terga impunctate. They are most similar to *L. versatum* and *L. paradmirandum*. Male *L. versatum* have distinct punctures on apical impressed areas of metasomal terga. Male *L. paradmirandum* have posterior margin of metapostnotum rounded.

Range. Ontario south to Georgia, west to Kansas. **USA**: IA, IL, IN, KS, MA, MD, MI, MO, PA, NC, NJ, NY, SC, TN, TX, VA, WI, WV. **CANADA**: ON.

Floral records. ASTERACEAE: *Flaveria linearis*.

DNA Barcode. Available. Multiple sequences.

Comments. Very common.

The original name given to this species is invalid due to secondary homonymy (Ebmer 1976; Gibbs 2010b).

Lasioglossum (*Dialictus*) *nigroviride* (Graenicher)

Halictus nigro-viridis Graenicher, 1910: 233. ♀.

Holotype. ♀ USA, Wisconsin, Swiss, Burnett Co., 27.vii.1909, [Milwaukee: 32837].

Halictus (*Chloralictus*) *richardsoni* Cockerell, 1937: 113. ♀.

Holotype. ♀ Canada, Alberta, Wabamun, 60 miles E of Edmonton, 1.vii.1935 (E.H. Strickland); [CNC: 4169]. Examined

Evylaeus pineolensis Mitchell, 1960: 358. ♂ . **[new synonymy]**

Holotype. ♂ USA, North Carolina, Pineola, 3.viii.1937 (D.L. Wray); [NMNH: 100875]. Examined. .

Dialictus nigroviridis Knerer and Atwood, 1962b: 169 (Emend.)

Taxonomy. Cockerell, 1937: *Halictus* (*Chloralictus*) *nigroviridis*, p. 113 (diagnosis); Michener, 1951: *Lasioglossum* (*Chloralictus*) *nigro-viride*, p. 1115, *L.* (*C.*) *richardsoni*, p. 1117 (catalogue); Mitchell, 1960: *Dialictus nigro-viridis* ♀♂, p. 406 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *nigroviride*, p. 464 (catalogue); Hurd, 1979: *Dialictus nigroviridis*, p. 1968, *D. richardsoni*, p. 1971 (catalogue); Moure & Hurd, 1987: *Dialictus nigroviridis*, p. 115, *D. richardsoni*, p. 127 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *nigroviride* ♀♂, p. 203 (redescription, key, synonymy).

Diagnosis. Female *L. nigroviride* can be recognised by the following diagnostic combination: size large (7.0–8.1 mm); head and mesosoma golden; gena wider than eye; mesoscutal punctures sparse between parapsidal lines (i=1–4d), sometimes sparse laterad of parapsidal line (i=1–2d); mesepisternal punctures distinct, sparse (i=1–2.5d) (Fig. 24A); lateral carina reaching or nearly reaching oblique carina (Fig. 2B); and metasomal terga black-brown, tomentum and apical fringes. They are superficially similar to *L. obscurum*, which is smaller (4.9–5.9 mm) with weak propodeal carinae, and sparse apical fringe hairs on metasomal terga.

Male *L. nigroviride* can be recognised by the following diagnostic combination: size large (7.0–7.5 mm); head and mesosoma golden green; flagellomeres elongate (length/width ratio = 1.60–1.87); mesoscutum polished due to weak microsculpture, punctures sparse between parapsidal lines (i=1–4d); mesepisternal punctures distinct; metasomal terga

blackish brown; and S3 and apicolateral portions of S4 with very dense plumose hairs. Male *L. obscurum* are similar but have relatively sparse hairs on the metasomal sterna.

Range. Nova Scotia west to British Columbia, south to Georgia. **USA**: GA, MA, MD, ME, NC, NH, NY, PA, VT, WA, WI, WV. **CANADA**: AB, BC, MB, NS, ON.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Lasioglossum (*Dialictus*) *novascotiae* (Mitchell)

Dialictus novascotiae Mitchell, 1960: 407. ♀.

Holotype. ♀ Canada, Nova Scotia, Baddeck, 27.viii.1926, [NCSU]. Examined.

Taxonomy. Knerer & Atwood, 1964: *Dialictus novascotiae* ♂, p. 5 (description); Krombein, 1967: *Lasioglossum* (*Dialictus*) *novascotiae*, p. 464 (catalogue); Hurd, 1979: *Dialictus novascotiae*, p. 1968 (catalogue); Moure & Hurd, 1987: *Dialictus novascotiae*, p. 115 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *novascotiae* ♀♂, p. 207 (redescription, key).

Diagnosis. Female *L. novascotiae* can be recognised by the following diagnostic combination: head wide (length/width ratio = 0.95–0.96), clypeus strongly protruding below suborbital tangent, mesoscutal punctures sparse throughout, mesepisternum rugulose, propodeum with dorsolateral slope rugulose (Fig. 27B), and metasomal terga blackish brown. They are most similar to *L. lineatulum*, which has head wider (length/width ratio = 0.92–0.93), propodeum with dorsolateral slope smooth (Fig. 27A), and metasomal terga with metallic reflections.

Male *L. novascotiae* can be recognised by the following diagnostic combination: mesoscutal punctures sparse throughout, mesepisternum rugulose, and metasomal sterna with subappressed plumose hairs limited to apicolateral portions of S3 and lateral portions of S4–S5. They are similar to *L. lineatulum*, which has dense plumose hairs on S2–S4 and S5 laterally. *Lasioglossum achilleae* is similar but has a shorter head and sparse punctation on metasomal terga.

Range. Nova Scotia west to Alaska, south to Michigan. **USA**: AK, ME, MI. **CANADA**: AB, BC, NB, NS, NT, ON, PE, SK.

DNA Barcode. Available. Multiple sequences.

Comments. Common in some localities.

Lasioglossum (*Dialictus*) *nymphaearum* (Robertson)

Halictus palustris Robertson, 1890: 317. ♀ ♂. (primary junior homonym of *Halictus palustris* Morawitz, 1876)

Syntypes. [ANSP]. Examined.

Halictus nymphaearum Robertson, 1895: 117 (replacement name for *H. palustris* Robertson).

Halictus paludicola Dalla Torre, 1896: 75 (replacement name for *H. palustris* Robertson).

Halictus oceanicus Cockerell, 1916: 11. ♀.

Holotype**.** ♀ USA, New Jersey, Ocean Grove, 12.vii.1893, [NMNH: 27769]. Examined.

Dialictus advertus Mitchell, 1960: 433. ♂.

Holotype**.** ♂ USA, Massachusetts, Reading, 23.vii.1933 (R. Dow); [NCSU]. Examined.

Taxonomy. Robertson, 1902b: *Chloralictus nymphaearum*, p. 248 (key); Viereck, 1916: *Halictus* (*Chloralictus*) *nymphaearum*, p. 706; Michener, 1951: *Lasioglossum* (*Chloralictus*) *nymphaearum*, p. 1115 (catalogue, synonymy); Mitchell, 1960: *Dialictus nymphaearum* ♀♂, p. 407 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *advertum*, p. 462, *L.* (*D.*) *nymphaearum*, p. 465 (catalogue); Hurd, 1979: *Dialictus advertus*, p. 1963, *D. nymphaearum*, p. 1969 (catalogue); Moure & Hurd, 1987: *Dialictus advertus*, p. 102, *D. nymphaearum*, p. 116 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *oceanicum* ♀♂, p. 220 (redescription, key, synonymy).

Diagnosis. Female *L. nymphaearum* can be recognised by the following diagnostic combination: size large (6.0–7.5 mm), hypostomal carina distally reflexed, mesoscutal punctures coarse (i=1–1.5d), metapostnotum with posterior dorsal margin carinate, and apical impressed areas of metasomal terga densely punctate

Male *L. nymphaearum* are similar to females but have hypostomal carina normal and transverse carina bordering metapostnotum dorsal surface distinctly bowed posteriorly. Male *L. nymphaearum* can be further distinguished by face below emargination with dense tomentum, head moderately elongate (length/width ratio = 0.97–1.00), and flagellomeres

short (length/width ratio = 1.13–1.33). They are most similar to *L. albipenne*, which lacks distinct punctures on the tegula and have a longer head (length/width ratio = 0.99–1.08).

Range. Nova Scotia west to Ontario, Minnesota, south to North Carolina. **USA**: CT, IL, IN, KS, MA, MD, MI, MN, MO, NC, NJ, NY, OK, PA, RI, TX, VA, WI, WV. **CANADA**: ON.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

The syntype series of *Halictus palustris* includes both *L. nymphaearum* as it is usually applied (*e.g.* Mitchell 1960) and *L. albipenne*. An invalid lectotype for *Halictus palustris* at ANSP (specimen number 4252) belongs to the latter species. Gibbs (2010b) considered this lectotype to be valid and as a result made *Halictus nymphaearum* a junior subjective synonym of *L. albipenne*. Gibbs (2010b) then applied the name *L. oceanicum* for the species traditionally called *L. nymphaearum*. Since it is now clear the lectotype for *Halictus palustris* at the ANSP is invalid (no published designation can be found), the standard usage of *L. nymphaearum* is applied herein to maintain nomenclatural stability. It is clear from Robertson's (1890) original description that he did not mean for *Halictus palustris* to apply to *L. albipenne*, which he describes in the same paper. The syntype series at ANSP includes specimens of *L. nymphaearum* as currently (and historically) applied. One of these will be designated as the lectotype to fix the name to a single species and maintain standard usage of *L. nymphaearum*.

Lasioglossum (*Dialictus*) *nymphale* (Smith)

(Figures 164–168)

Halictus nymphalis Smith, 1853: 68. ♀.

Holotype. ♀ USA, Florida (East), St. John's Bluff; [BMNH].

Taxonomy. Cockerell, 1905: *Halictus nymphalis*, p. 352 (tax. notes); Michener, 1951: *Lasioglossum* (*Chloralictus*) *nymphale*, p. 1115 (catalogue); Mitchell, 1960: *Dialictus nymphalis* ♀♂, p. 409 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *nymphale*, p. 465 (catalogue); Moure and Hurd, 1987: *Dialictus nymphalis*, p. 116 (catalogue).

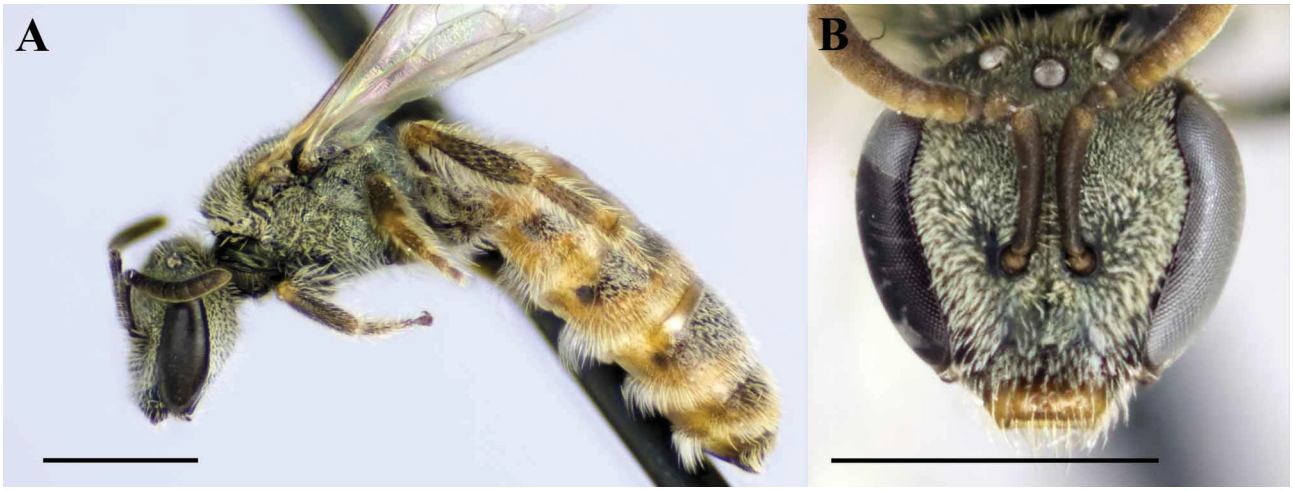

FIGURE 164. *Lasioglossum nymphale* (Smith) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Diagnosis. Female *L. nymphale* can be recognised by the following diagnostic combination: clypeus amber apically (Fig. 164B); mesoscutum not obscured by tomentum, punctures moderately dense (i=1–1.5d) (Fig. 165); tegula ovoid; and metasoma orange-yellow (Fig. 164A). They are similar to *L. pictum* and *L. arantium*, which both have apical half of clypeus blackish brown. Female *L. vierecki* have mesoscutum obscured by dense yellowish tomentum (Fig. 29B).

Male *L. nymphale* can be recognised by the combination of clypeus amber apically (Fig. 166B), mesoscutal punctation moderately dense (i=1–1.5d) (Fig. 167), mesepisternal punctures deep and distinct, metasomal terga reddish (Fig. 166A), apical impressed areas with narrow impunctate posterior portion.

Redescription. FEMALE. Length 3.93–4.78 mm; head length 1.26–1.32 mm; head width 1.25–1.34 mm; forewing length 2.84–2.96 mm.

FIGURE 165. *Lasioglossum nymphale* (Smith) female, dorsal view of mesosoma.

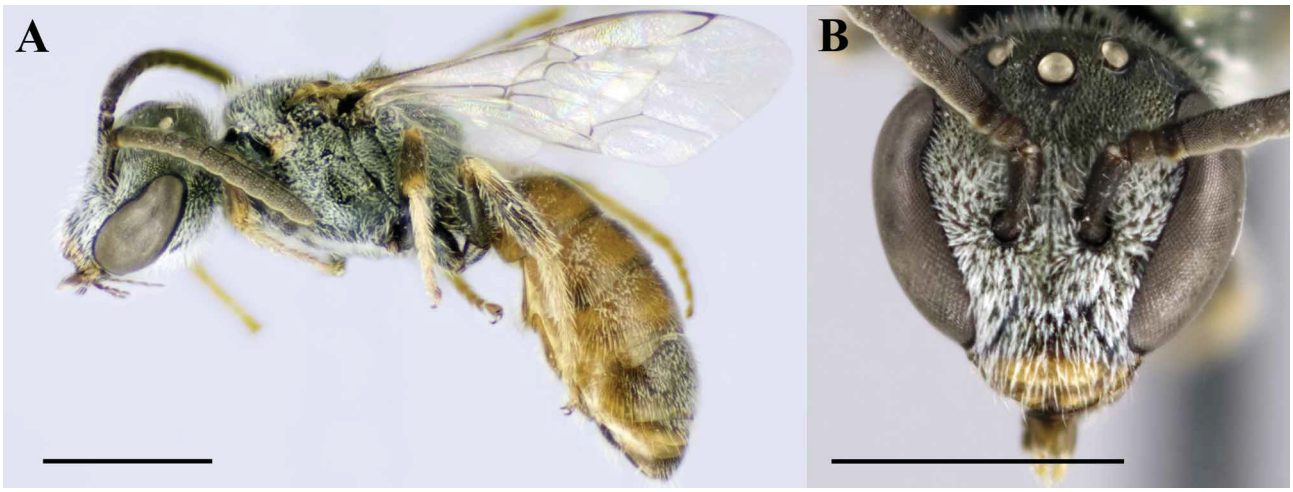

FIGURE 166. *Lasioglossum nymphale* (Smith) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Colouration. Head and mesosoma pale green. Labrum, mandible, and apical half of clypeus amber to yellow. Antenna dark brown, flagellum with ventral surface orange-yellow. Tegula pale brownish amber to yellow. Wing membrane subhyaline, venation and pterostigma pale brownish yellow. Legs brown, except tibial bases and apices, and tarsi brownish yellow. Metasoma terga orange-yellow, sometimes brown basally; terga and sterna with apical margins translucent yellow.

Pubescence. Dull white. Moderately dense. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Lower paraocular area and gena with subappressed tomentum, partially obscuring surface. Metepisternum obscured by tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately dense, fine hairs.

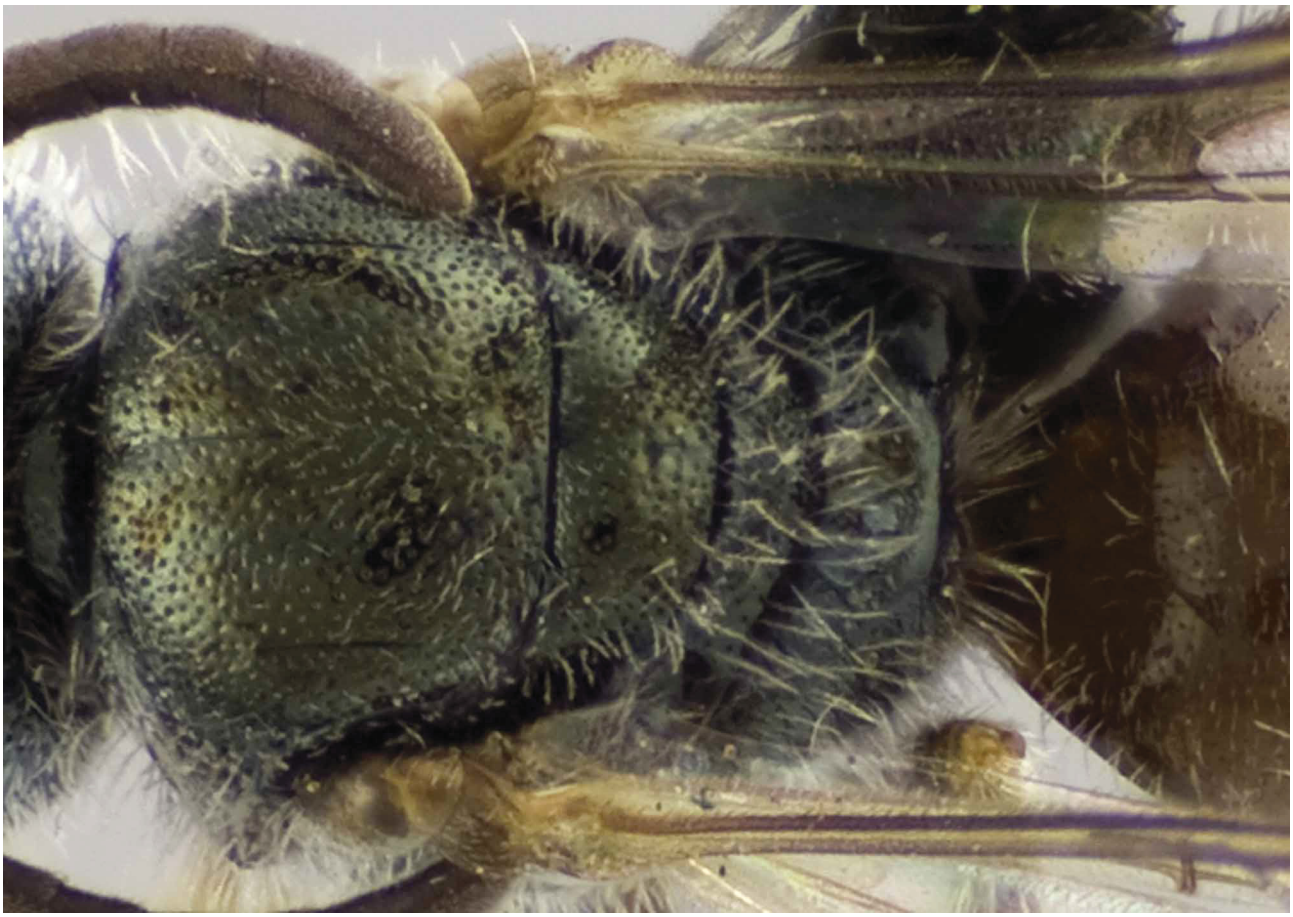

FIGURE 167. *Lasioglossum nymphale* (Smith) male, dorsal view of mesosoma.

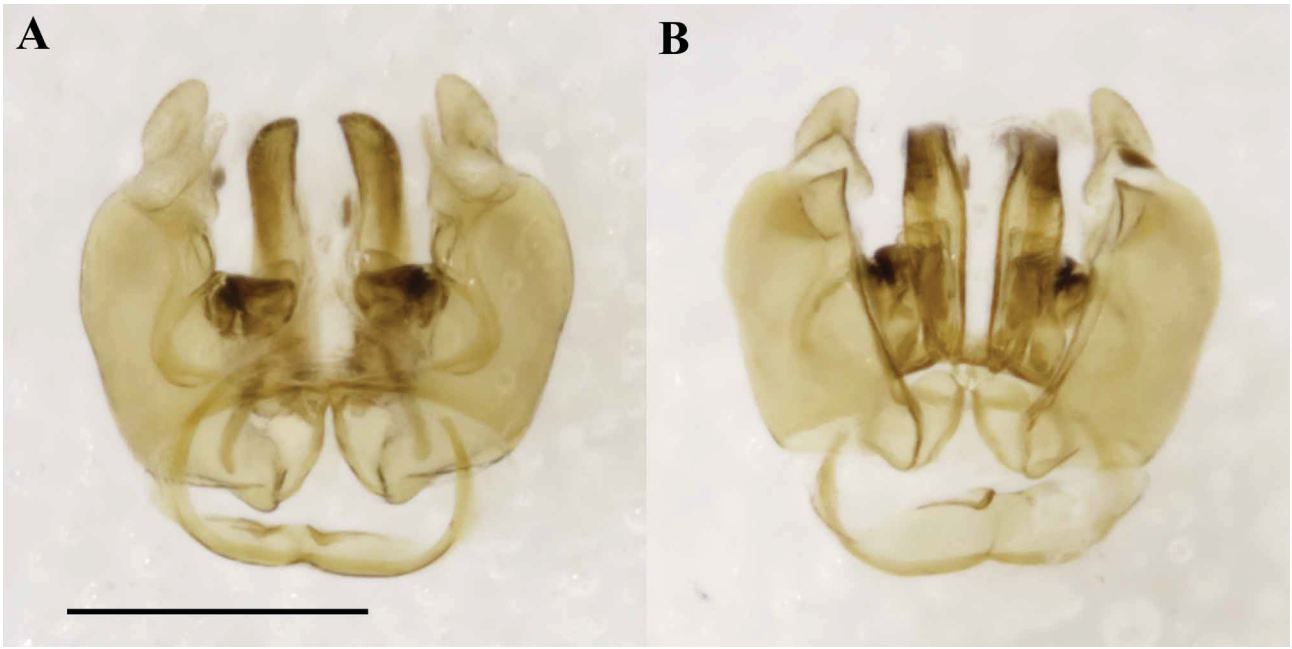

FIGURE 168. *Lasioglossum nymphale* (Smith) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

T1 acarinarial fan sparse, without dorsal opening (obscure on pale background). T1 dorsolaterally, T2 basolaterally and T3–T4 entirely with moderately dense tomentum obscuring surface. T2 apicolateral and T3–T4 apical margins with sparse apical fringes.

Surface sculpture. Face imbricate, punctation moderately strong. Clypeus with apical half polished, punctation moderately dense (i=1–1.5d). Supraclypeal area with punctation dense (i≤d). Lower paraocular area and antennocular area punctation dense (i≤d). Upper paraocular area, frons and ocellocular area punctate-reticulate. Gena and postgena lineolate. Mesoscutum weakly imbricate, polished submedially, punctation moderately dense between parapsidal lines (i=1–1.5d), contiguous laterad of parapsidal line and punctate-reticulate on anterolateral portion. Mesoscutellum imbricate, submedial punctation sparse (i=1–2d). Axilla punctate. Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate-punctate. Mesepisternum rugulose-punctate (i≤d), more polished below. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum with anastomosing rugae nearly reaching posterior margin. Propodeum with dorsolateral slope ruguloso-imbricate, lateral surface imbricate, posterior surface tessellate. Metasomal terga polished except apical impressed areas weakly coriarious, punctation fine throughout, close on basal halves (i=1–1.5d), sparser marginal zone (i=1–2d).

Structure. Head wide (length/width ratio = 0.98–1.01). Eyes convergent below (UOD/LOD ratio = 1.31–1.35). Clypeus 1/2 below suborbital tangent, apicolateral margins strongly convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2–2.5 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum truncate (MMR ratio = 1.38–1.39), posterior margin weakly angled onto posterior surface. Propodeum with oblique carina obscure, lateral carina weak, not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 3.81–4.30 mm; head length 1.27–1.31 mm; head width 1.27–1.32 mm; forewing length 2.84 mm.

Colouration. Labrum, mandible, and apical half of clypeus amber to yellow. Flagellum with ventral surface reddish brown. Tegula reddish brown. Pterostigma reddish brown. Legs brown, except tibial bases and apices, and tarsi brownish yellow. Metasoma reddish brown, darker basally, apical margins orange to brownish yellow.

Pubescence. Lower paraocular area with subappressed tomentum obscuring surface. T2–T3 laterally and T4 basally with sparse tomentum.

Surface sculpture. Surface more polished. Mesepisternal punctation deep and distinct (i≤d). Propodeum with dorsolateral slope rugulose, obscurely punctate, lateral and posterior surfaces polished, punctate. Metasomal terga with punctation deep and distinct across disc (i≤d), apical impressed areas impunctate except narrowly punctate basally

Structure. Head round (length/width ratio = 0.99–1.00). Eyes strongly convergent below (UOD/LOD ratio = 1.48–1.59). Clypeus with apicolateral margins weakly convergent. Antennal sockets distant (IAD/OAD < 1.0). Frontal line carinate, ending 2 OD below median ocellus. Pedicel subequal to F1. F2 length 1.5X F1. F2–F10 moderately short (length/width ratio = 1.33–1.50). Metapostnotum moderately truncate (MMR ratio = 1.25–1.38), posterior margin narrowly rounded onto posterior surface.

Terminalia. S7 with median lobe clavate, apex rounded (Fig. 168). S8 with apicomedial margin strongly convex (Fig. 168). Genital capsule as in Fig. 168. Gonobase with ventral arms widely separated. Volsella roughly ovoid. Gonostylus small. Retrorse lobe elongate, attenuated apically.

Range. Virginia south to Florida, west to Mississippi (Fig. 169). **USA**: AL, FL, GA, MS, NC, SC, VA.

Additional material examined. USA: ALABAMA: 1♀ Baldwin Co., Bon Secour N.W. Ref., T9S R2E Sec. 25 S, 12.x.1991 (G.C. Eickwort); 3♀♀2♂♂ Baldwin Co., Ft. Morgan S.P., T9S R1E Sec. 1,2, 15.x.1991 (G.C. Eickwort); FLORIDA: 4♀♀ Highlands Co., Archbold Biol. Stn., 1–8.vi.1987 (D.B. Wahl); 4♀♀ 1♂ Highlands Co., Archbold Biol. Stn., 9–16.vi.1987 (D.B. Wahl); 8♀♀ Levy Co., 5 km SW Archer, 1.v–13.vii.1987; [BRC Hym Team); [CNC]; 1♀ Duval Co., Little Talbot Island S.P., 1.v.1974 (G.C. Eickwort); 1♀ Franklin Co., coast, 10 mi. S. of Panacea, 7.iv.1964 (G.C. Eickwort); 1♂ Welaka, 18–20.iv.1955 (H.E. & M.A. Evans); [CUIC]; 3♀♀ Highlands Co., N27.5461 W081.507, 3.vi.2007 (S.W. Droege); 5♀♀ 1♂ Martin Co., N27.0886 W081.1518, 4.vi.2007 (S.W. Droege); 1♀ Pasco Co., Dade City, 5.v.1993 (L. Packer); 3♀♀ Polk Co., N27.8164 W081.5974, 3.vi.2007 (S.W. Droege); [PCYU]; 1♀ Inverness (C. Robertson); [UCMC]; GEORGIA: 1♂ Forsyth, 5–10.vi.1971 (F.T. Naumann); [CNC]; 18♀♀ Liberty Co., St. Catherines Isl., 22–27.vi.1995 (A. Sharkov); [PCYU]; MISSISSPPI: 3♀♀ Jackson Co., N30.3675 W088.7194, 4–5.vi.2005 (S.W. Droege); [PCYU]; NORTH CAROLINA: 1♀ Highlands, 1.vii.1957 (W.R.M. Mason); [CNC]; 1♀ Bladen Co., 3 mi. S Ammon, 4.v.1963 (G.A. Matuza); [CUIC]; 4♀♀ Dare Co., N36.0306 W075.6764, 13.vii.2006 (S.W. Droege); [PCYU]; SOUTH CAROLINA: 1♀ Aiken, 31.v.1957 (W.J. Brown); 1♀ Aiken, 24.viii.1957 (W.J. Brown); [CNC]; ♀ Chesterfield Co., N34.5036 W080.22485, 18–19.v.2006 (S.W. Droege); VIRGINIA: 1♀ Page Co., Shenandoah N.P. , 8.vii.1987 (J.T. Huber); [CNC]; 1♀ Virginia Beach, N36.9167 W076.05, 16–17.vi.2007 (W. Steiner); [PCYU].

FIGURE 169. Distribution map of *Lasioglossum nymphale* (circles).

Floral records. ASTERACEAE: *Bidens*, *Erigeron*, *Helenium*, *Pityopsis graminifolia* var. *tracyi*, *Solidago*, *Stokesia*; BRASSICACEAE: *Lepidium virginicum*, *Warea carteri*; CACTACEAE: *Opuntia austrina*; ERICACEAE: *Vaccinium arboretum*; EUPHORBIACEAE: *Croton cascarilla*; FABACEAE: *Amorpha*, *"Cracca"*, *Dalea*, *Galactia pinetorum*, *Melilotus*; FAGACEAE: *Castanea*; LAMIACEAE: *Monarda*, PORTULACACEAE: *Portulaca oleracea*; RHAMNACEAE: *Ceanothus*; ROSACEAE: *Pyracantha*, *Rubus*.

DNA Barcode. Available. Multiple sequences.

Comments. Common. *Lasioglossum nymphale* evidently has a preference for sandy areas.

Lasioglossum (*Dialictus*) *oblongum* (Lovell)

Halictus oblongus Lovell, 1905a: 40. ♀♂.

Syntypes. ♀♂ USA, Maine, Waldoboro, 24.viii, on *Eupatorium perfoliatum* [depository unknown].

Taxonomy. Lovell, 1905a: *Halictus versans* ♂, p. 39 (misdet.); Lovell, 1908: *Halictus* (*Chloralictus*) *oblongus* ♂, p. 38 (description); Michener, 1951: *Lasioglossum* (*Chloralictus*) *oblongum*, p. 1115 (catalogue); Mitchell, 1960: *Dialictus oblongus* ♀♂, p. 409 (redescription, key); Krombein, 1967: *Lasioglossum* (*Dialictus*) *oblongum*, p. 465 (catalogue); Hurd, 1979: *Dialictus oblongus*, p. 1969 (catalogue); Moure & Hurd, 1987: *Dialictus oblongus*, p. 116 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *oblongum* ♀♂, p. 211 (redescription, key).

Diagnosis. Female *L. oblongum* can be recognised by the following diagnostic combination: head wide (length/width ratio = 0.94–0.95); supraclypeal area densely punctate (i≤d); mesoscutum imbricate, punctures moderately sparse between parapsidal lines (i=1–2d); mesepisternum weakly rugose; metapostnotum coarsely carinate with shining interstitial areas; T1 acarinarial fan with wide dorsal opening; and metasomal terga polished, appressed tomentum virtually absent.

Male *L. oblongum* are similar to females but may be further distinguished by the head relatively elongate (length/width ratio = 0.98–1.01), flagellomeres moderately elongate (length/width ratio = 1.54–1.58), and S3 –S5 apicolateral portions with moderately dense, plumose hairs.

Range. Quebec, Ontario, south to Virginia, east to Massachusetts. **USA**: DC, DE, IN, MA, MD, NJ, NY, VA, WI. **CANADA**: ON, PQ.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon.

Lasioglossum oblongum has been reported to nest in rotten wood (Sakagami & Michener 1962). Individuals of *L. oblongum*, in the sense used here, have indeed been collected from under the bark of fallen logs.

The name *L. oblongum* has been applied in a sense believed to be consistent with standard usage in the last 50 years (see Mitchell 1960; Gibbs 2010b). Until the type series is located, it remains unclear if the species referred to here as *L. oblongum* is the same as the one described by Lovell (1905a).

Lasioglossum (*Dialictus*) *obscurum* (Robertson)

Halictus obscurus Robertson 1892: 270. ♀.

Lectotype. ♀ USA, Illinois, Macoupin Co., Carlinville, 8.v.1891 (C. Robertson); [INHS: 10959] by W. E. LaBerge (in Webb 1980). Examined.

Taxonomy. Robertson, 1902b: *Chloralictus obscurus*, p. 249 (key)**;** Viereck 1916: *Halictus* (*Chloralictus*) *obscurus*, p. 707 (key); Michener, 1951: *Lasioglossum obscurum*, p. 1115 (catalogue); Mitchell, 1960: *Dialictus obscurus* ♀, p. 376 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *obscurum*, p. 465, (catalogue); Hurd, 1979: *Dialictus obscurum*, p. 1969, (catalogue); Moure & Hurd, 1987: *Dialictus obscurus*, p. 117, (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *obscurum* ♀♂, p. 215 (redescription, key, synonymy).

Diagnosis. Female *L. obscurum* can be recognised by the following diagnostic combination: mesoscutal punctures sparse throughout, mesepisternal punctures distinct (Fig. 24A), propodeal carinae weak, and metasomal terga without tomentum but with very sparse apical fringes. They are superficially similar to *L. nigroviride* and *L. tenax*. Female *L. nigroviride* have moderately strong propodeal carinae and no fringe hairs on metasomal terga. Female *L. tenax* have dense punctures on the lateral portions of the mesoscutum.

Male *L. obscurum* can be recognised by the following diagnostic combination: head moderately elongate (length/width ratio = 1.02–1.05); flagellomeres elongate (length/width ratio = 1.50–1.92); postgena imbricate; mesoscutum imbricate, punctures sparse (i=1–4d), denser laterad of parapsidal line (i=1–1.5d); mesepisternum punctate; apical impressed areas of metasomal terga impunctate; and S3–S5 apicolateral portions with sparse plumose hairs. They are similar to *L. nigroviride*, *L. cattellae*, *L subversans*, and *L. tenax*. Males of *L. nigroviride* and *L. subversans* have distinctly dense plumose hairs on the metasomal sterna. Male *L. tenax* have obscure mesepisternal punctures and the punctures of the metasomal terga limited to the basal portions and the premarginal lines. Male *L. cattellae* are small (4.3–4.5 mm), with coarse mesoscutal and mesepisternal punctures, and distinctly lineolate postgena.

Range. Ontario, south to North Carolina, west to Wisconsin. **USA**: CT, GA, IL, MD, MN, MI, MO, NC, NH, NY, OH, PA, TN, VT, WI, WV. **CANADA**: ON.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Lasioglossum (*Dialictus*) *paradmirandum* (Knerer & Atwood)

Dialictus paradmirandus Knerer and Atwood, 1966a: 886. ♀♂.

Holotype. ♀ CANADA, Ontario, Iona, Elgin Co., 1.ix.1963 on *Solidago*, (G. Knerer), [ROM: 83856]. Examined.

Taxonomy. Hurd, 1979: *Dialictus paradmirandus*, p. 1969 (catalogue); Moure & Hurd, 1987: *Dialictus paradmirandus*, p. 119 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *paradmirandum* ♀♂, p. 237 (redescription, key).

Diagnosis. Female *L. paradmirandum* can be recognised by the following diagnostic combination: mesoscutum tessellate, punctures moderately dense between parapsidal lines (i=1–2d); mesepisternum tessellate-imbricate, shallow punctures visible; T1 acarinarial fan with dorsal opening; T1 declivitous surface with distinct coriarious microsculpture; T3–T4 with moderately dense tomentum partially obscuring surface and distinct apical fringes. They are most similar to *L. fattigi* and *L. admirandum*. Female *L. fattigi* have a more robust head, moderately sparse punctures on lower paraocular area (i=1–1.5d), weakly imbricate mesoscutum, and T3–T4 have sparse tomentum not obscuring surface and sparse apical fringe hairs. Female *L. admirandum* have metasomal terga polished without evident microsculpture on declivitous surface of T1.

Male *L. paradmirandum* are similar to females but may be further distinguished by head moderately elongate (length/width ratio = 1.03–1.04); flagellomeres long (length/width ratio = 1.69–1.83), pale brownish yellow ventrally; mesepisternum weakly reticulate dorsally, tessellate ventrally; metapostnotum rounded onto posterior propodeal surface, and apical impressed areas of metasomal terga impunctate. They are most similar to *L. mitchelli* and *L. fattigi*. Male *L. mitchelli* have metapostnotum sharply angled onto posterior propodeal surface, mesoscutum more densely punctate, and mesepisternum rugulose. Male *L. fattigi* have elongate heads (length/width ratio = 1.07) and mesepisternum imbricate-tessellate dorsally.

Range. Ontario south to North Carolina, west to Wisconsin, Iowa. **USA**: IA, IL, IN, MD, MI, MO, NC, NY, PA, WI, WV. **CANADA**: ON.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon. See Gibbs (2010).

Lasioglossum (*Dialictus*) *perpunctatum* (Ellis)

Halictus perpunctatus Ellis, 1913: 210. ♀.

Holotype. ♀ USA, Colorado, Boulder, 20.iv., on *Claytonia*, (T.D.A. Cockerell), [CAS: 15617]. Examined.

Halictus brycinci Crawford, 1932: 70. ♀.

Holotype. ♀ USA, North Carolina, Bryson City, 14.iv.1923, (J.C. Crawford), [NMNH: 40304]. Examined.

Dialictus highlandicus Mitchell, 1960: 398. ♀.

Holotype. ♀ USA, North Carolina, Highlands, 22.vii.1958 [NCSU]. Examined.

Dialictus junaluskensis Mitchell, 1960: 437. ♂.

Holotype. ♂ USA, North Carolina, Lake Junaluska, 9.vi.1955, (H.V. Weems, Jr.), [FSCA]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *perpunctatum*, p. 1116 (catalogue); Mitchell, 1960: *Dialictus perpunctatus* ♀♂, p. 411, *H. brysinci* (*lapsus calami*), p. 411 (redescription, key, synonymy); Krombein, 1967: *Lasioglossum* (*Dialictus*) *highlandicum*, p. 464, *L.* (*D.*) *junaluskense*, p. 464, *L.* (*D.*) *perpunctatum*, p. 465 (catalogue); Hurd, 1979: *Dialictus highlandicus*, p. 1966, *D. junaluskensis*, p. 1967, *D. perpunctatus*, p. 1970 (catalogue); Moure & Hurd, 1987: *Dialictus highlandicus*, p. 104, *D. junaluskensis*, p. 109, *D. perpunctatus*, p. 121 (catalogue); Gibbs 2010b: *Lasioglossum* (*Dialictus*) *perpunctatum* ♀♂, p. 244 (redescription, key, synonymy).

Diagnosis. Female *L. perpunctatum* can be recognised by the following diagnostic combination: head wide (length/width ratio = 0.95–0.96); postgena polished; mesoscutal punctures dense throughout (i≤d) (Fig. 13A); mesepisternum punctate; metapostnotal rugae reaching posterior margin; tegula ovoid with small posterior angle; metasomal terga brown, sometimes with obscure greenish reflections; T1 acarinarial fan large, dorsal opening absent; and T3–T4 with abundant tomentum. They are similar to *L. miniatulum* and *L. sheffieldi*. Female *L. miniatulum* have postgena lineolate and less dense tomentum on T3. Female *L. sheffieldi* have head longer (length/width ratio = 1.00–1.01) and distinctly separated punctures on median portion of mesoscutum.

Male *L. perpunctatum* can be recognised by the following combination: heads moderately elongate (length/width ratio = 1.00–1.03); flagellomeres moderately elongate (length/width ratio = 1.43–1.58); mesoscutal punctures coarse,

sparse between parapsidal lines (i=1–2d); tegula with small posterior; mesepisternum distinctly punctate; metapostnotum with rugae reaching posterior margin; and metasomal terga with distinct punctures, sparser on apical impressed areas. They are similar to *L. sheffieldi* which has a longer head (length/width ratio = 1.06–1.08).

Range. Nova Scotia west to Manitoba and Colorado, south to North Carolina. **USA**: CO, IN, ME, MN, NC, NJ, NY, SD, WI. **CANADA**: AB, MB, NS, ON, PE, SK.

DNA Barcode. Available. Multiple sequences.

Comments. Common. See Gibbs (2010).

Lasioglossum (*Dialictus*) *pictum* (Crawford)

Halictus pictus Crawford, 1902a: 236. ♀.

Syntypes. 2♀ USA, Nebraska, Crawford, Sioux Co., 29.vii.1901 on *Mentzelia*, (M.A. Carriker); [UNSM]. Examined.

Halictus graenicheri Ellis, 1914b: 221. ♀.

Holotype. 1♀ USA, Wisconsin, Genoa, Vernon Co., Wisconsin, 13–19.vii.1911 [NMNH: 27761]. Examined.

Dialictus muskegonensis Mitchell, 1960: 439. ♂.

Holotype. ♂ USA, Michigan, Muskegon Co., 2.viii.1944, (R.R. Dreisbach); [NCSU]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *graenicheri*, p. 1113, *L.* (*C.*) *pictum*, p. 1116 (catalogue); Krombein, 1958: *Lasioglossum* (*Chloralictus*) *graenicheri*, p. 230, (catalogue); Mitchell, 1960: *Dialictus pictus* ♀, p. 412 (redescription, synonymy); Mitchell, 1962: *Dialictus pictus*, p. 547 (synonymy); Krombein, 1967: *Lasioglossum* (*Dialictus*) *pictum*, p. 465 (catalogue); Hurd, 1979: *Dialictus pictus*, p. 1970 (catalogue); Moure & Hurd, 1987: *Dialictus pictus*, p. 122 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *pictum* ♀♂, p. 249 (redescription, key).

Diagnosis. Female *L. pictum* can be recognised by the following diagnostic combination clypeus black-brown distally; postgena polished; lower paraocular area with moderately sparse tomentum; mesoscutum not obscured by tomentum; mesepisternum reticulate-punctate; legs mostly brown; and metasoma orange-yellow metasoma, apical impressed areas obscurely punctate. They are most similar to *L. arantium*, which has a reddish orange metasoma and a completely lineolate postgena.

Male *L. pictum* can be recognised by head moderately elongate (length/width ratio = 0.98–1.02); face with moderately dense tomentum; flagellomeres short, orange-yellow ventrally; mesoscutal punctures moderately sparse (i=1–2d); parapsidal line narrow; mesepisternum distinctly punctate; and metasomal terga reddish brown, apical margins orange-yellow. They are similar to *L. foveolatum*, which has a very deep and wide parapsidal lines (Fig. 15B) and brown metasomal terga.

Range. Ontario west to Alberta and Nebraska. **USA**: IN, MI, MN, NE, WI. **CANADA**: AB, MB, ON, SK.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon east of the Mississippi.

Lasioglossum (*Dialictus*) *pilosum* (Smith)

Halictus pilosus Smith, 1853: 71. ♀.

Holotype. ♀ North America [BMNH: B.M. Type 17a 1000]. Examined.

Halictus floridanus caesareus Cockerell, 1916: 11. ♀.

Holotype. ♀ USA, New Jersey, Ocean Grove, 12.vi.1893 [NMNH: 27761]. Examined.

Taxonomy. Robertson, 1895: *Halictus pilosus* ♂, p. 117 (description); Robertson, 1902b: *Chloralictus pilosus*, p. 248 (key); Cockerell, 1905: *Halictus pilosus* ♀, p. 351 (redescription); Viereck, 1916: *Halictus* (*Chloralictus*) *pilosus*, p. 706 (key); Michener, 1951: *Lasioglossum* (*Chloralictus*) *floridanum caesareum*, p. 1113, *L.* (*C.*) *pilosum*, p. 1116 (catalogue); Mitchell, 1960: *Dialictus pilosus pilosus* ♀♂, p. 413 (redescription); Mitchell, 1962: *Dialictus pilosus pilous*, p. 547 (synonymy); Krombein, 1967: *Lasioglossum* (*Dialictus*) *pilosum pilosum*, p. 465 (catalogue); *Dialictus pilosus pilosus*, p. 1970 (catalogue); Moure & Hurd, 1987: *Dialictus pilosus pilosus*, p. 123 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *pilosum* ♀♂, p. 253 (redescription, key, synonymy).

Diagnosis. Female *L. pilosum* can be recognised by the following diagnostic combination: head long (length/width ratio = 1.03–1.08), clypeus apicolateral margins subparallel, mesoscutal punctures dense throughout (i<d), metapostno-

tum rugoso-carinulate, and metasomal terga metallic with dense yellowish tomentum. They are similar to *L. floridanum*, *L. leucocomum* and *L. succinipenne*. Female *L. floridanum* have fine metapostnotal rugae, which are obscure among background microsculpture. Female *L. leucocomum* and *L. succinipenne* have convergent apicolateral margins of the clypeus.

Male *L. pilosum* can be recognised by head long (length/width ratio = 1.13–1.17); eyes strongly convergent below (UOD/LOD ratio = 1.35–1.64); clypeus yellow distally; mesoscutal punctures very dense, contiguous medially; metapostnotum rugoso-carinulate; and metasomal terga metallic, punctures dense and distinct. They are most similar to *L. floridanum*, *L. leucocomum* and *L. succinipenne*. Male *L. floridanum* have weak metapostnotal rugae and usually lack a clypeal maculation. Male *L. leucocomum* have sparser mesoscutal punctures medially. Male *L. succinipenne* have punctures visible on the mesepisternum.

Range. Nova Scotia west to Wisconsin, south to Georgia. **USA**: CT, GA, IN, MA, MD, ME, MI, NC, NH, NJ, NY, PA, TN, VA, WI, WV. **CANADA**: NS, ON, PQ.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Gibbs (2010b) narrowed the usage of this name and raised the names *L. leucocomum* and *L. floridanum* to species level, as discussed above. Gibbs (2010b) reported a less southerly range for *L. pilosum* but additional material has since been identified from CUIC.

Lasioglossum (*Dialictus*) *planatum* (Lovell)

Halictus planatus Lovell, 1905b: 300. ♀

Lectotype. ♀ USA, Maine, Waldoboro, (J.H. Lovell); [NMNH: 71572] designated herein. Examined.

Taxonomy. Wolf & Ascher, 2009: *Lasioglossum* (*Dialictus*) *planatum*, p. 144 (faunal list, combination); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *planatum* ♀, p. 259 (redescription, key).

Diagnosis. Female *L. planatum* can be recognised by the following diagnostic combination: mesoscutal punctures sparse between parapsidal lines; mesepisternum rugulose; metapostnotum with weak rugae, except long medial carina; T1 polished due to lack of microsculpture; T1 acarinarial fan with wide dorsal opening; and metasomal terga with sparse tomentum limited to basolateral patches. They are similar to *L. ephialtum*, which has stronger metapostnotal rugae, which reach the posterior margin and more abundant tomentum on the metasomal terga.

Male unknown.

Range. Newfoundland, New Brunswick west to British Columbia and Northwest Territories, south to New York. **USA**: MA, ME, NY, WI. **CANADA**: AB, BC, NB, NF, NS, NT, ON, PE, PQ.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon.

The name-bearing type has lectotype labels from both Mitchell and Covell. No publication by either of these authors could be found that makes a valid lectotype designation. *Lasioglossum planatum* was recently resurrected from synonymy with *L. oblongum* by Gibbs (2010b). To maintain stable usage of the name, the specimen indicated above is designated as the lectotype.

Lasioglossum (*Dialictus*) *platyparium* (Robertson)

Halictus platyparius Robertson, 1895: 117. ♀.

Lectotype. ♀ USA, Illinois, Macoupin Co. Carlinville, 18.v.1887 (C. Robertson); [INHS: 3995] by W. E. LaBerge (in Webb 1980). Examined.

Taxonomy. Robertson, 1901: *Paralictus platyparius*, p. 229 (generic description); Michener, 1951: *Lasioglossum* (*Paralictus*) *platyparium*, p. 1119 (catalogue); Mitchell, 1960: *Paralictus platyparius* ♀♂, p. 448 (redescription); Krombein, 1967: *Lasioglossum* (*Paralictus*) *platyparium*, p. 467 (catalogue); *Paralictus platyparius*, p. 1974 (catalogue); Moure & Hurd, 1987: *Paralictus platyparius*, p. 143 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *platyparium* ♀♂, p. 261 (redescription, key).

Diagnosis. Female *L. platyparium* can be recognised by the following diagnostic combination: scopa absent; gena wider than eye; mandible large, converging to point only near apex, distinct preapical tooth absent; labrum with distinct basal tubercle, apical process flat, dorsal keel absent (Fig. 6B); and metapostnotum rugoso-carinulate. They are similar to *L. cephalotes* and *L. rozeni*. Female *L. rozeni* have a narrow mandible that is evenly convergent along its entire length and lacks a distinct basal tubercle on the labrum. Female *L. cephalotes* lack a distinct basal tubercle on the labrum and have a smooth metapostnotum without evident rugae.

Male *L. platyparium* can be recognised by head wide (length/width ratio = 0.95–0.96), dorsolateral angle of pronotum acute, pronotal collar weak, and mesepisternum rugulose.

Range. Ontario south to Georgia, Louisiana and west to Minnesota. **USA**: DC, GA, IL, KS, LA, MD, MN, MO, NC, PA, WV, WI. **CANADA**: ON.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon.

Lasioglossum platyparium is presumed to be a social parasite of nest-building *Dialictus*. It is perhaps the most commonly collected of the parasitic *L.* (*Dialictus*) but its host species remains unknown.

Lasioglossum (*Dialictus*) *pruinosum* (Robertson)

Halictus pruinosus Robertson, 1892: 269. ♀♂.

Lectotype. ♀ USA, Illinois, Macoupin Co., Carlinville, 22.v.1891 (C. Robertson); [INHS: 11121] by W. E. LaBerge (in Webb 1980). Examined.

Taxonomy. Robertson, 1902b: *Chloralictus pruinosus*, p. 248 (key); Cockerell, 1909: *Halictus pruinosus*, p. 9 (tax. comp.); Michener, 1951: *Lasioglossum* (*Chloralictus*) *pruinosum*, p. 1116 (catalogue); Mitchell, 1960: *Dialictus pruinosus* ♀♂, p. 415. (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *pruinosum*, p. 465 (catalogue); *Dialictus pruinosus*, p. 1970 (catalogue); Moure & Hurd, 1987: *Dialictus pruinosus*, p. 125 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *pruinosum* ♀♂, p. 269 (redescription, key).

Diagnosis. Female *L. pruinosum* can be recognised by the following diagnostic combination: head long (length/width ratio = 1.05–1.09); mesoscutal punctation dense (i<d), except on medial portion (i=1–1.5d); mesepisternum rugulose; wings hyaline; pterostigma nearly white pterostigma; and metasomal terga with abundant tomentum. They are most similar to *L. succinipenne*, which has the mesoscutal punctures dense throughout.

Male *L. pruinosum* can be recognised by the following diagnostic combination: head long (length/width ratio = 1.18–1.21), covered in dense white tomentum; clypeus with distal yellow maculation; flagellomeres short (length/width ratio = 1.15–1.30), bright yellow ventrally; mesoscutal punctation moderately sparse medially (i=1–2d); mesepisternum rugoso-reticulate; and metasomal terga bluish green, distinctly punctate. They are most similar to *L. albipenne*, which lacks yellow on clypeus and have brown metasomal terga.

Range. British Columbia and south to Arizona east to north-eastern USA. **USA**: AZ, CO, IA, ID, IN, MI, MN, NE, TX, UT, WI. **CANADA**: AB, BC, MB, SK.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon in the eastern United States. See Gibbs (2010).

Lasioglossum (*Dialictus*) *puteulanum* Gibbs

Lasioglossum (*Dialictus*) *puteulanum* Gibbs, 2009a: 25. ♀♂.

Holotype. ♀ USA, Florida, Palm Beach Co., N26.34889 W80.2756, 25.i.2005 (S.W. Droege); [PCYU].

Diagnosis. Female *L. puteulanum* can be recognised by the following diagnostic combination: tegula enlarged, strongly punctate with distinct posterior angle; head relatively long (length/width ratio = 0.95–1.10); head and mesosoma usually deep blue; and mesepisternum with strong microsculpture between punctures. They are similar to *L. tegulare* and *L. lepidii* which are both primarily green with shorter heads (length/width ratio = 0.85–1.00).

Male *L. puteulanum* also have an enlarged tegula and can be distinguished from similar species by T2 densely punctate immediately basal of premarginal line and facial tomentum dense on lower paraocular area but sparse on remainder

of face. They are most similar to *L. tegulare* and *L. lepidii*. Male *L. tegulare* have less tomentum distributed outside of the lower paraocular area. Male *L. lepidii* have dense facial tomentum, which obscures the clypeus.

Range. Alabama, Florida north to southern North Carolina. **USA**: AL, FL, GA, NC, SC, TN.

DNA Barcode. Available. Multiple sequences.

Comments. Common. See Gibbs (2009a).

Lasioglossum (*Dialictus*) *raleighense* (Crawford)

(Figures 170–173)

Halictus raleighensis Crawford, 1932: 73. ♀.

Holotype. ♀ USA, North Carolina, Raleigh, 5.vi.1923, on *Baptisia tinctoria*, (T.B. Mitchell); [AMNH]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *raleighense* Michener, 1951: 1117 (catalogue); Mitchell, 1960: *Dialictus raleighensis* ♀♂, p. 416 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *raleighense*, p. 465 (catalogue); Moure and Hurd, 1987: *Dialictus raleighensis*, p. 126 (catalogue).

Diagnosis. Female *L. raleighense* can be recognised by the following diagnostic combination: clypeus and supraclypeal area flat, dull due to microsculpture (Fig. 170B); mesoscutal punctation dense (i<d) (Fig. 171); metasomal terga brown, tomentum, moderately sparse, and apical impressed areas with deep, distinct punctation. They are most similar to *L. batya*, which has supraclypeal area polished and shiny (Fig. 69B).

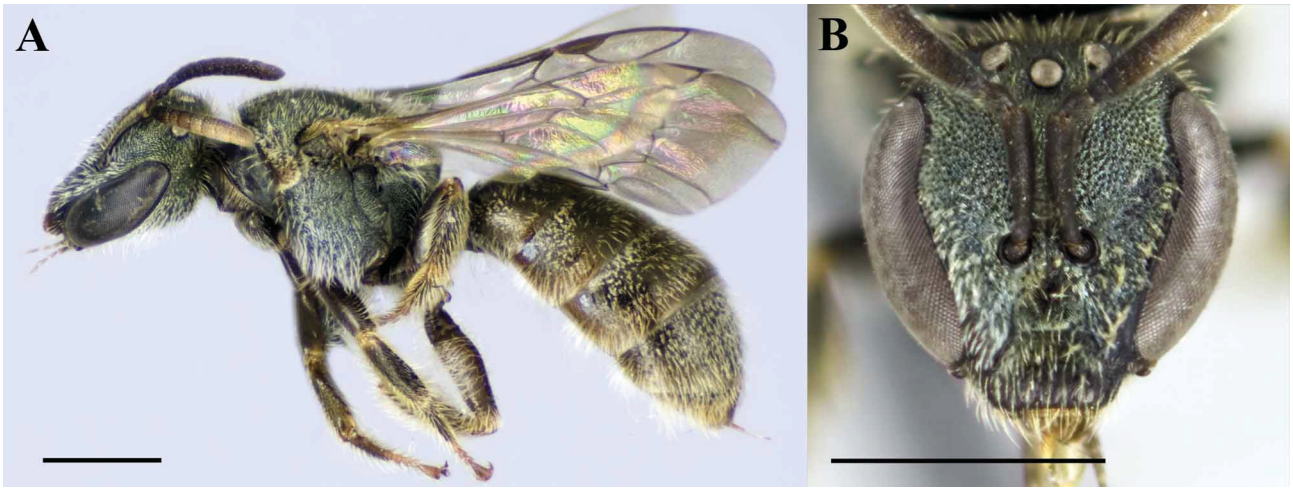

FIGURE 170. *Lasioglossum raleighense* (Crawford) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Male *L. raleighense* can be recognised by the following diagnostic combination: clypeus yellow distally (Fig. 172B), supraclypeal area imbricate, flagellomeres short (F2–F10 length/width ratio = 1.13–1.18) (Fig. 172B), mesoscutal punctures contiguous, and metasomal terga with apical impressed areas deeply and distinctly punctate. They are most similar to *L. batya*, which has supraclypeal area polished and shiny.

Redescription. FEMALE. Length 4.60–4.96 mm; head length 1.37–1.44 mm; head width 1.34–1.42 mm; forewing length 2.96–3.15 mm.

Colouration. Head and mesosoma pale green to bluish green. Clypeus with apical half blackish brown. Supraclypeal area bronze. Antenna dark brown, flagellum with ventral surface reddish brown to orange-yellow. Tegula amber. Wings faintly dusky, venation and pterostigma reddish brown. Legs brown, except medio- and distitarsi reddish brown. Metasomal terga golden brown with narrow reddish rim, sterna brown, apical margins pale, translucent yellow.

Pubescence. Dull white. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena with subappressed tomentum partially obscuring surface. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately dense, fine hairs. T1 acarinarial fan complete. T1 dorsolateral portion with sparse tomentum. T2–T3 laterally and T4 entirely with sparse tomentum not obscuring surface. T2 apicolateral and T3–T4 apical margins with sparse fringes.

FIGURE 171. *Lasioglossum raleighense* (Crawford). dorsal view of mesosoma.

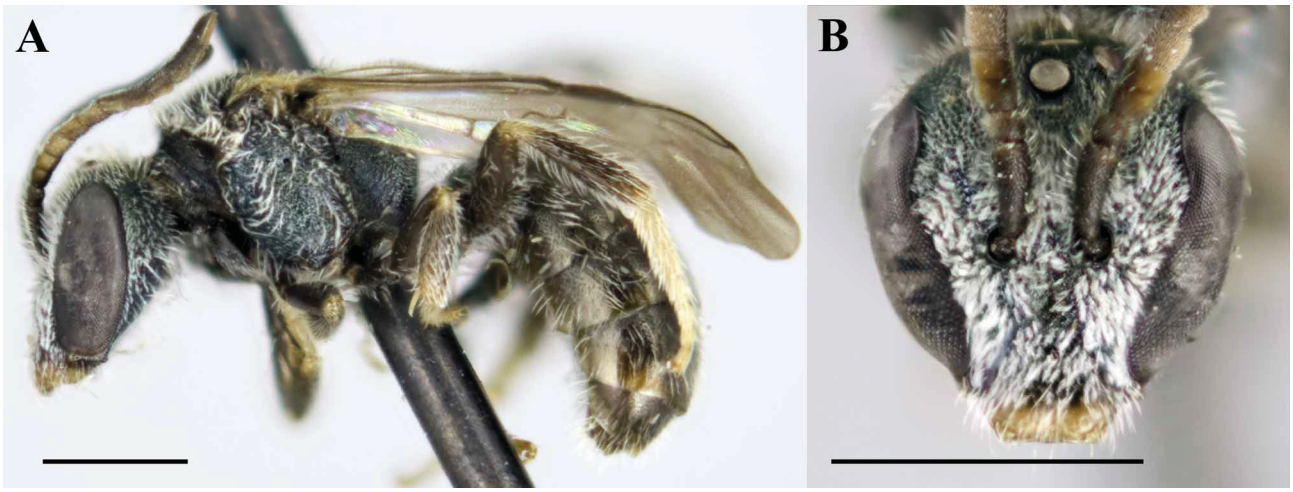

FIGURE 172. *Lasioglossum raleighense* (Crawford) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Surface sculpture. Face tessellate-imbricate, punctation fine. Clypeus punctation evenly spaced (i=1–2d). Supraclypeal area imbricate, punctation moderately sparse (i=1–3d). Lower paraocular and antennocular areas with punctation dense (i≤d). Upper paraocular area, frons and ocellocular area punctate-reticulate. Gena and postgena lineolate. Mesoscutum and mesoscutellum tessellate, punctation dense throughout (i≤d). Axilla punctate-reticulate. Metanotum imbricate. Preëpisternum rugose. Hypoepimeral area reticulate-rugulose. Mesepisternum reticulate-rugulose, weakly rugulose posteriorly. Metepisternum with dorsal portion rugoso-carinulate, ventral half imbricate. Metapostnotum with weak rugae poorly defined amidst tessellate interstices, posterior margin tessellate-granular. Propodeum with dorsolateral slope tes-

sellate, lateral surface and posterior rugulose-imbricate. Metasomal terga polished, apical impressed areas weakly coriarious, punctation dense and distinct throughout (i=1–1.5d).

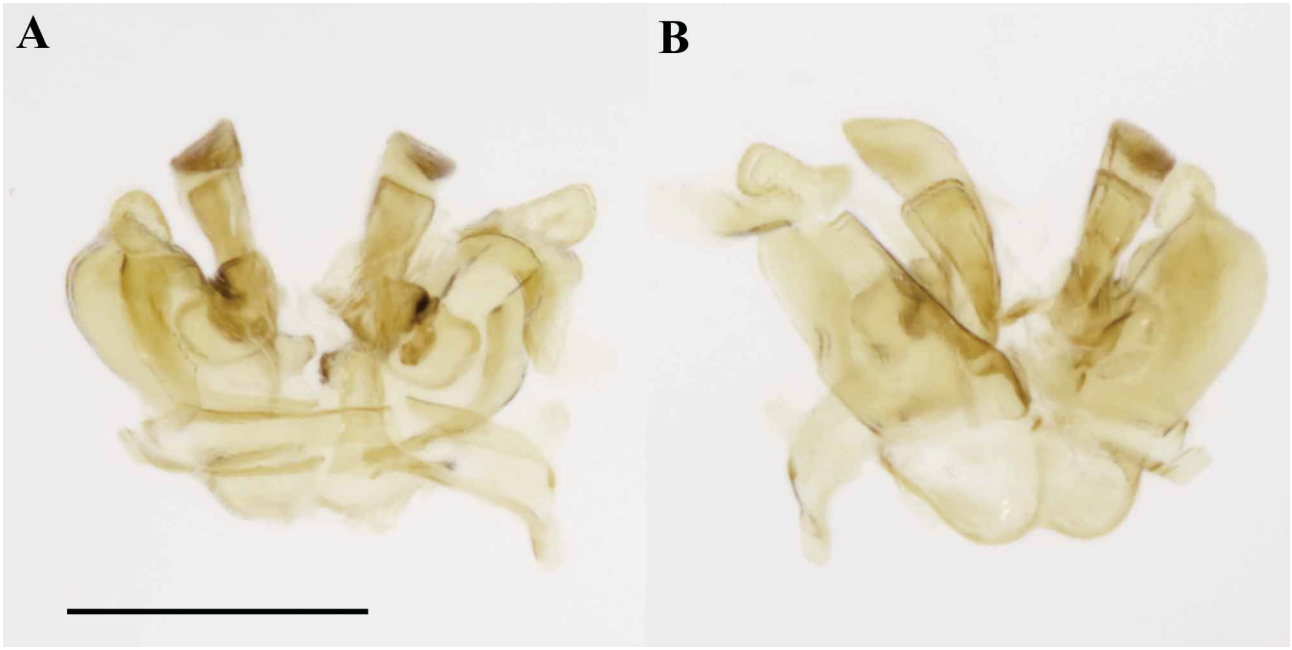

FIGURE 173. *Lasioglossum raleighense* (Crawford) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

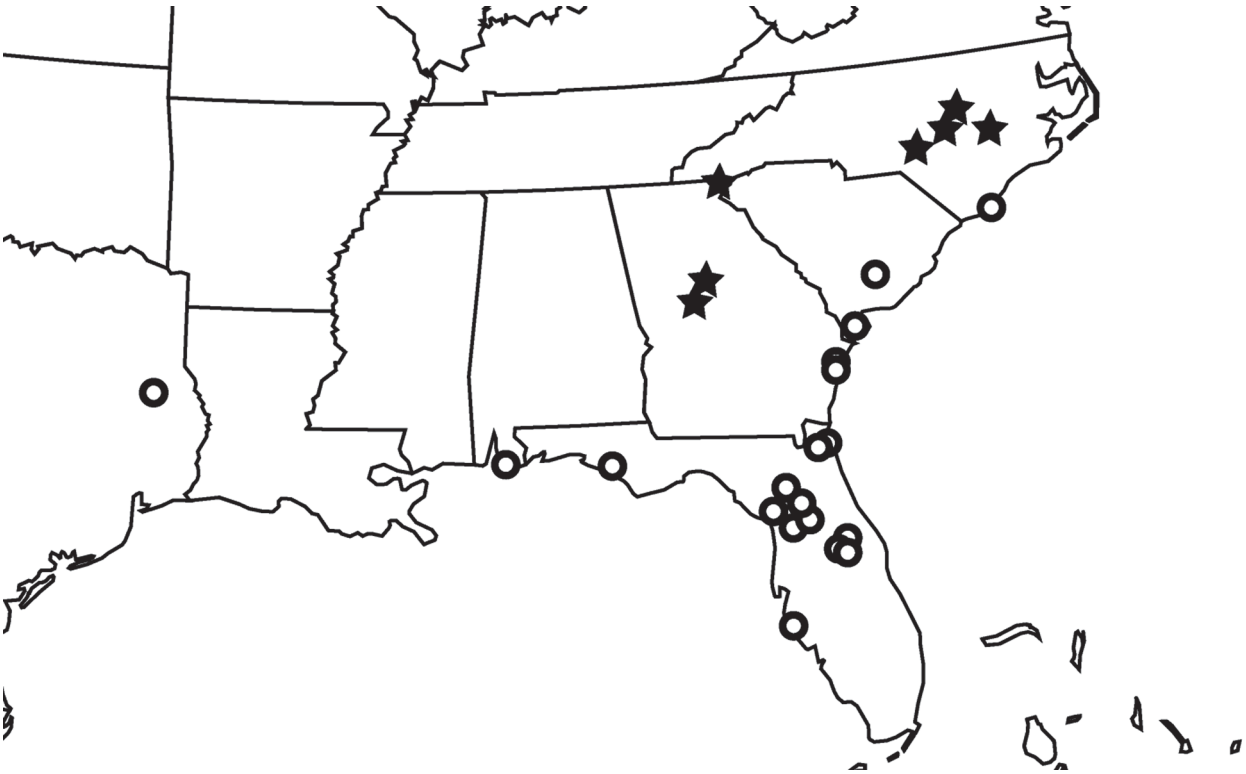

FIGURE 174. Distribution map of *Lasioglossum raleighense* (stars) and *L. reticulatum* (circles).

Structure. Head round to elongate (length/width ratio = 1.00–1.03). Eyes strongly convergent below (UOD/LOD ratio = 1.44–1.48). Clypeus ½ below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum truncate (MMR ratio = 1.30–1.44), lateral

margin distinct, posterior margin weakly angled onto posterior surface. Propodeum with oblique carina fine, lateral carina not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 3.39–3.96 mm; head length 1.30–1.32 mm; head width 1.21–1.25 mm; forewing length 2.78–2.84 mm.

Colouration. Labrum, mandible and distal margin of clypeus brownish yellow. Flagellum with ventral surface brownish yellow. Legs brown, except tibial bases and apices and tarsi brownish yellow.

Pubescence. Paraocular area below eye emargination with tomentum obscuring surface. S2–S4 with moderately elongate woolly hairs (1.5–2 OD).

Surface sculpture. Clypeus and supraclypeal area imbricate, punctation moderately dense (i=1–1.5d). Mesepisternum reticulate-punctate dorsally. T1 anterior surface with punctures evenly spaced (i=1–2.5d).

Structure. Head elongate (length/width ratio = 1.06–1.07). Eyes strongly convergent below (UOD/LOD ratio = 1.67). Clypeus 2/3 below suborbital tangent, apicolateral margins subparallel. Antennal sockets distant (IAD/OAD = 1.0). Frontal line carinate, ending 2 OD below median ocellus. Pedicel subequal to F1. F2 length 1.0–1.1X F1. F2–F10 short (length/width ratio = 1.13–1.18). Metapostnotum moderately truncate (MMR ratio = 1.22–1.41), posterior margin rounded onto posterior surface.

Terminalia. S7 with median lobe nearly parallel sided, apex rounded (Fig. 173). S8 with apicomedial margin weakly convex (Fig. 173). Genital capsule as in Fig. 173. Gonobase with ventral arms widely separated. Volsella short, nearly round. Gonostylus small, dorsal setae elongate. Retrorse lobe elongate, strongly attenuated apically, apex recurved.

Range. North Carolina south to Georgia (Fig. 174). **USA**; GA, NC.

Additional material examined. USA: GEORGIA: 4♀♀ 1♂ Forsyth, 23–30.ix.1970 (F.T. Naumann); 1♀ Rabun Bald, 4700 ft., 16.vii..1957 (W.R. Richards); 1♀ Rabun Bald, 9.viii.1957 (L.A. Kelton); [CNC]; 3♀♀ Jasper Co., 18.vii.2008 (J. Hanula & S. Horn); [PCYU]; NORTH CAROLINA: 1♀ Wayne Co., 23.v.1954 (T.B. Mitchell); [CUIC]; 2♀♀ Harnett Co., 18.v.1935 (H.F. Schoof); 1♀ Wayne Co., 23.v.1954 (T.B. Mitchell); 3♀♀ Raleigh, 17.v.1942 (T.B. Mitchell); 1♀ Southern Pines, 23.ix.1950 (T.B. Mitchell); [NCSU].

Floral records. FABACEAE: *Baptisia tinctoria*, *Galactia*, *Tephrosia*; POLYGONACEAE: *Polygonum*.

DNA Barcode. Available. Multiple sequences.

Comments. Uncommon.

Lasioglossum raleighense is used in a more restricted sense than in previous studies (*e.g*. Mitchell 1960), due to the description of the related species *L. batya* (above).

Lasioglossum (*Dialictus*) *reticulatum* (Robertson)

(Figures 175–179)

Halictus fulvipes Smith, 1853: 67. ♀. (junior primary homonym of *Halictus fulvipes* Klug, *in* Germar, 1817)
Holotype. ♀ USA, Florida (East), St. John's Bluff; [BMNH]. Examined.

Halictus reticulatus Robertson, 1892: 268. ♀.
Lectotype. ♀ USA, Florida, Citrus Co., Inverness, 12.ii.1891 (C. Robertson) [INHS: 9987] by W. E. LaBerge (in Webb 1980). Examined.

Halictus rhododactylus Dalla Torre, 1896: 80 (replacement name for *H. fulvipes* Smith).

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *reticulatum*, p. 1117 (catalogue); Mitchell, 1960: *Dialictus reticulatus*, p. 416 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *reticulatum*, p. 465 (catalogue); Moure and Hurd, 1987: *Dialictus reticulatus*, p. 126 (catalogue).

Diagnosis. Female *L. reticulatum* can be distinguished from all other eastern USA *Dialictus* except *L. bruneri* by the widely divergent hypostomal carinae (Fig. 10C) and coarsely sculptured mesosoma (Figs. 4A, 176). Female *L. reticulatum* lack the distally produced hypostomal carina and anteriorly excavated protrochanter that are present in *L. bruneri*.

Male *L. reticulatum* can be recognised by the combination of mesoscutum rugose on anterior margin (Fig. 178), mesepisternum coarsely rugose, and tibiae and femora and reddish brown (Fig. 177A). They are most similar *L. bruneri*, which have tibiae and femora dark brown.

Redescription. FEMALE. Length 6.23–6.66 mm; head length 1.63–1.92 mm; head width 1.74–2.02 mm; forewing length 4.17–4.96 mm.

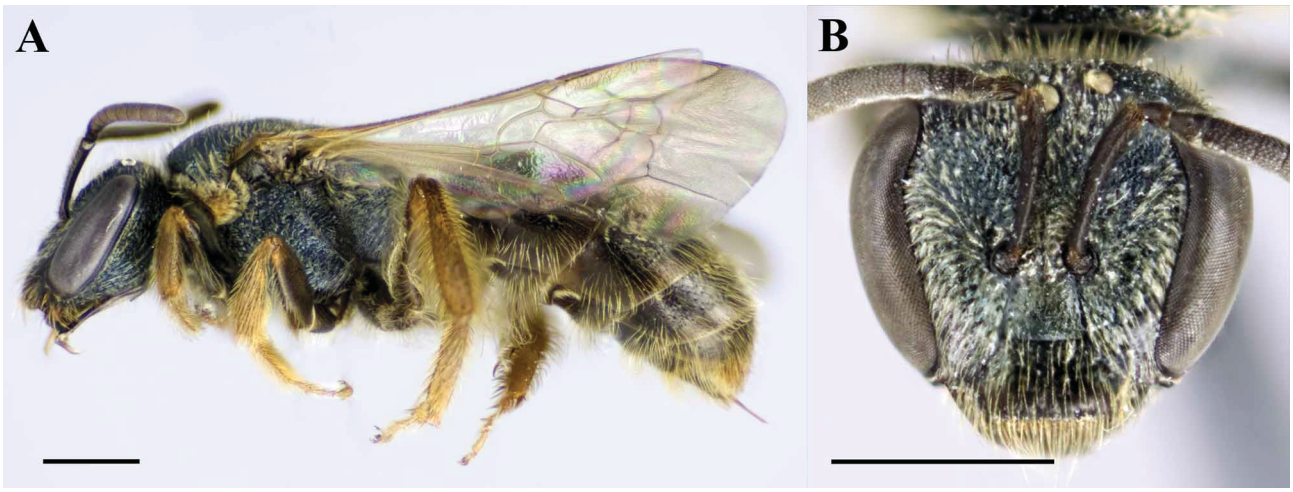

FIGURE 175. *Lasioglossum reticulatum* (Robertson) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 176. *Lasioglossum reticulatum* (Robertson) female, dorsal view of mesosoma.

Colouration. Head and mesosoma bluish green. Labrum and mandible reddish brown. Antenna blackish brown, flagellum with ventral surface brown. Tegula reddish brown. Wing venation and pterostigma amber. Legs brown except tarsi, outer surface of protibia, apex and base of mesotibia, and metatibia reddish brown to amber. Metasoma blackish brown, terga and sterna with apical margins reddish brown.

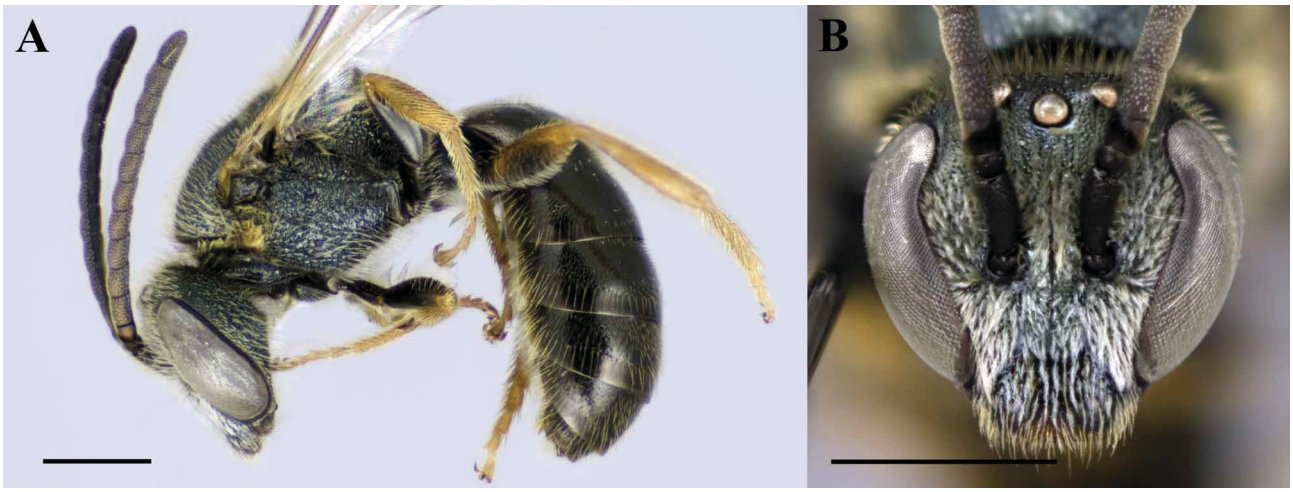

FIGURE 177. *Lasioglossum reticulatum* (Robertson) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 178. *Lasioglossum reticulatum* (Robertson) male, dorsal view of mesosoma.

Pubescence. Dull white to yellowish white. Moderately dense. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area with sparse subappressed hairs. Gena with sparse tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with sparse, fine hairs. T1 acarinarial fan with narrow dorsomedial opening above, nearly reaching upper margin of declivitous surface. T2–T3 basolateral areas obscured by dense tomentum. T4 disc largely obscured by dense tomentum and with sparse, fringes. T2 apicolateral and T3–T4 apical margins with sparse apical fringes.

Surface sculpture. Face weakly imbricate, punctation strong. Clypeal punctation moderately dense (i=1–2d). Supraclypeal area and lower paraocular are punctation dense (i<d). Antennocular area rugose. Upper paraocular area and frons punctate-reticulate. Ocellocular area punctation irregular (i≤d). Gena and postgena coarsely carinulate. Mesoscutum imbricate, punctation very strong, distinctly separated medially (i≤d), rugoso-reticulate laterad of parapsidal line and anterolaterally. Mesoscutellum weakly imbricate, submedial punctation moderately sparse (i=1–3d). Axilla reticulate. Metanotum rugose. Preëpisternum and mesepisternum coarsely rugose, lower mesepisternum polished, carinulate-punctate. Metepisternum with upper half rugoso-carinulate, lower half imbricate. Metapostnotum coarsely rugoso-carinulate, interstices polished and shining. Propodeum with dorsolateral slope coarsely rugose, lateral and posterior surfaces rugulose. Metasomal terga polished except apical margins coriarious, most evident on T3–T4, punctation fine and deep throughout (i=1–2d).

Structure. Head wide (length/width ratio = 0.93–0.94). Eyes convergent below (UOD/LOD ratio = 1.10–1.18). Clypeus 1/2 below suborbital line, apicolateral angles rounded. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2 OD below median ocellus. Gena nearly as wide as eye. Hypostomal area deeply excavated, carinae widely divergent towards mandible bases. Pronotum with dorsolateral angle obtuse. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum delimited from remainder of dorsal surface weak carina. Metapostnotum relatively truncate (MMR ratio = 1.29–1.50), posterior margin carinate. Propodeum with oblique carina strong, lateral carina reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 5.81 mm; head length 1.66 mm; head width 1.70 mm; forewing length 4.17–4.36 mm.

Colouration. Head and mesosoma dull metallic blue with green reflections. Flagellum with ventral surface reddish brown. Tegula yellowish brown. Wing venation and pterostigma brownish yellow. Legs brown, except metafemora dorsally, tibiae, and tarsi brownish yellow to orange.

Pubescence. Face with tomentum obscuring lower paraocular area and partially obscuring clypeus, supraclypeal area, upper paraocular area and frons. Metasomal terga without tomentum. S3 with dense plumose hairs and S4–S5 with lateral plumose hairs.

Surface sculpture. Coarse throughout. Mesoscutellum reticulate. Metepisternum rugoso-carinulate. Metasomal terga with apical impressed margins virtually impunctate.

Structure. Head moderately wide (length/width ratio = 0.97). Eyes strongly convergent below (UOD/LOD ratio = 1.40). Clypeus 2/3 below suborbital line, apicolateral margins subparallel. Antennal sockets distant (IAD/OAD < 1.3). Frontal line carinate, ending <2 OD below median ocellus. Hypostomal carinae only slightly divergent towards mandibles. Pedicel shorter than F1. F2 length 1.8X F1. F2–F10 moderately elongate (length/width ratio = 1.38–1.83). Metapostnotum moderately elongate (MMR ratio = 1.21), posterior margin sharply angled onto posterior surface.

Terminalia. S7 with median lobe narrowly clavate, sides concave, apex rounded (Fig. 179). S8 with apicomedial margin weakly convex (Fig. 179). Genital capsule as in Fig. 179. Gonobase with ventral arms narrowly separated. Volsella roughly ovoid. Gonostylus narrow and elongate, dorsal setae elongate. Retrorse lobe elongate, attenuated apically.

Range. South-eastern USA (Fig. 174). **USA**: AL, FL, GA, NC, SC, TX.

Additional material examined. USA: ALABAMA: 1♀ Baldwin Co., Bon Secour N.W. Ref., T9S R2E Sec. 25 N, 13.x.1991 (G.C. Eickwort); 1♀ Baldwin Co., Bon Secour N.W. Ref., T9S R2E Sec. 23 E, 24 W, 12–16.x.1991 (T. Scheifer); FLORIDA: 1♀ Bay Co., St. Andrews S.P., 17.iv.1964 (G.C. Eickwort); 1♂ Lake Co., Leesburg, 8.v.1961 (C.H. Curran); 1♀ Levy Co., 13.ix.1955 (R.A. Morse); 1♀ Marion Co., Ocala N.F., 30 mi E Ocala, 30.iii.1974 (G.C. Eickwort); [CUIC]; 1♀ Alachua Co., Gainesville, 18–25.vi.1987 (D.B. Wahl); [CNC]; 1♀1♂ Inverness (C. Robertson); [INHS]; 1♀ Duval Co., 2.iv.1959 (T.B. Mitchell); [NCSU]; 2♂♂ Sarasota Co., MCC – Venice Campus, 24.iii.1997 (K.J. Maharay, S.M. Fullerton); 26♀♀ Seminole Co., Lower Wekiva River St. Pres., 22.vii.2001 (P. Russell, S. Fullerton); 50♀♀ Seminole Co., Lower Wekiva River St. Pres., 2.xii.2001 (P. Russell, S. Fullerton); [UCFC]; GEORGIA: 72 ♀♀ Liberty Co., St. Catherines Isl., N31◦41′ W81◦09′, 31.iv–04.v.1995 (A. Sharkov); 12 ♀♀ Liberty Co., St. Catherines Isl., N31◦40.3′ W81◦09.5′, 23-28.vi.1996 (A. Sharkov); 24 ♀♀ Liberty Co., St. Catherines Isl., Road b/w Windmill 2nd and Gator Pond, 22–27.vi.1995 (A. Sharkov); [PCYU]; 1♀ McIntosh Co., Sapelo Isl, 28.iv–9.v.1987 (BRC Hym Team); [CNC]; NORTH CAROLINA: 1♀ Carolina beach, 20.iv.1930; [CUIC]; TEXAS: 1♀ Nacogdoches Co., N31.5011 W094.7839, 2–18.vi.2010 (C. Adams); [CUIC]; SOUTH CAROLINA: 7♀♀ Dorchester Co., Francis Beidler For., 10 km NE Harleyville, bald cypress swamp, 11–23.vi.1987; 28♀♀ 3♂♂ Hilton Head Is., 11–23.vii.1965 (H.F. Howden); [CNC].

Floral records. ANACARDIACEAE: *Rhus*; ASTERACEAE: *Bidens*, *Solidago*; CAPRIFOLIACEAE: *Lonicera dioica*; ERICACEAE: Vaccinium; FABACEAE: *Melilotus*; ROSACEAE: *Crataegus*, *Photinia*, *Prunus*, *Rubus*; SMILACACEAE: *Smilax ecirrhata*, *S. herbacea*, *S. tamnoides*.

DNA Barcode. Available.

Comments. Common.

Some specimens of *L. bruneri* particularly in the Midwest lack strongly produced hypostomal carinae. These have sometimes been mistaken for *L. reticulatum* as a result.

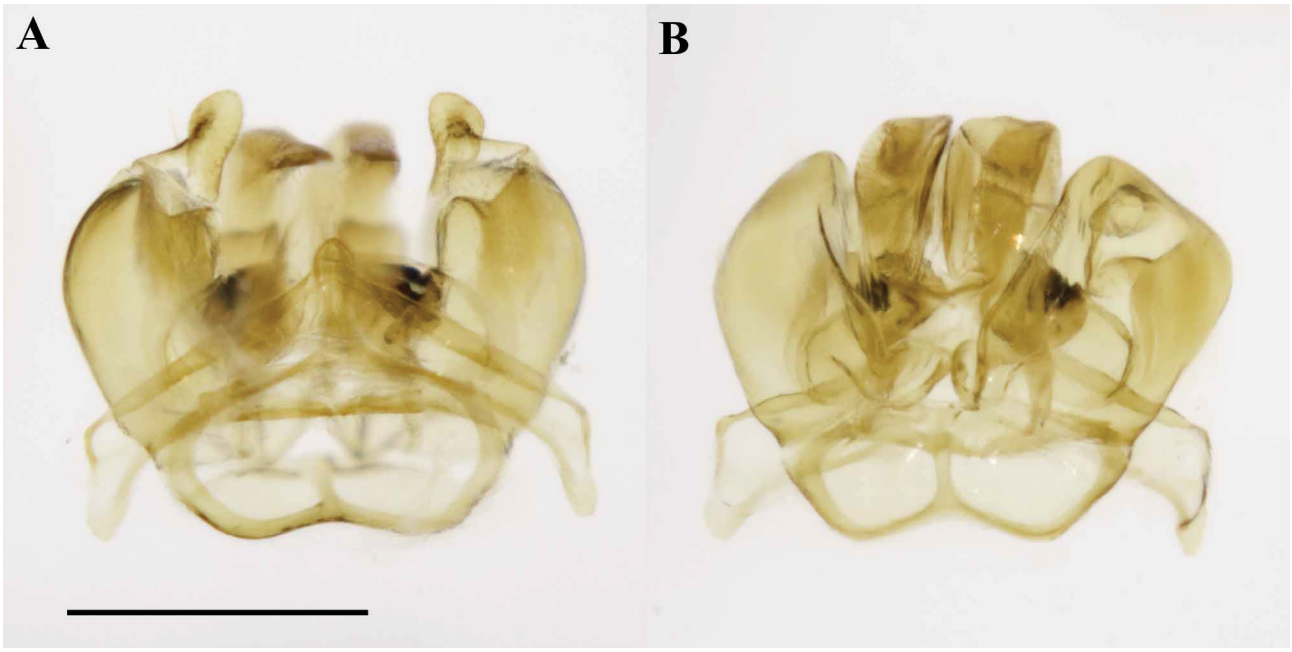

FIGURE 179. *Lasioglossum reticulatum* (Robertson) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

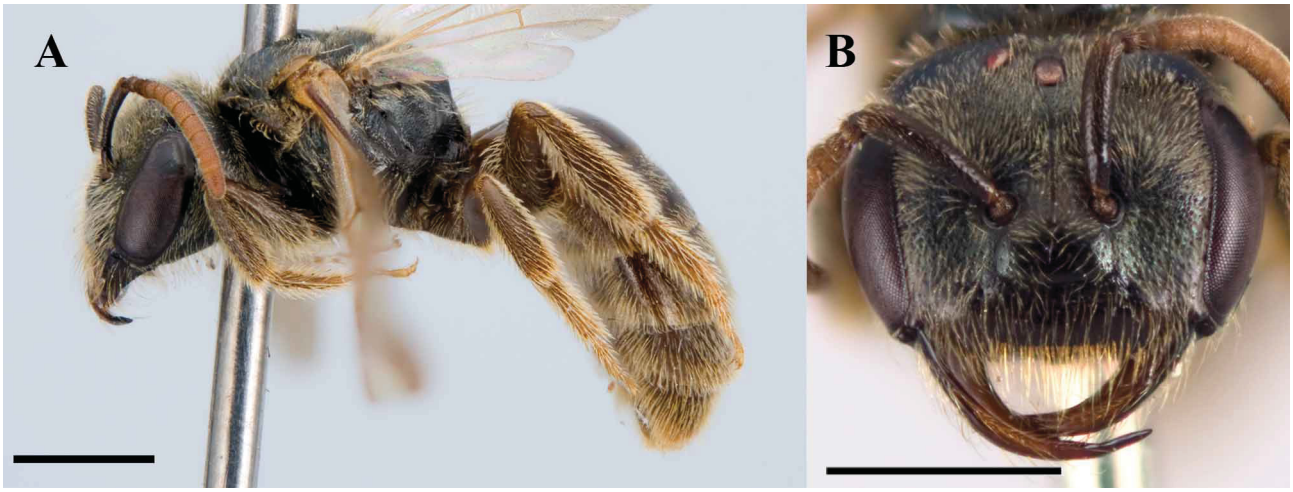

FIGURE 180. *Lasioglossum rozeni* Gibbs female, (A) lateral habitus, (B) face. Scale bars = 1 mm. (Modified from Gibbs 2010b).

Lasioglossum (*Dialictus*) *rozeni* Gibbs, new species

(Figures 180–184)

Holotype. ♀ USA, Maryland, Talbot Co., N38.8 W.076.2833, 7–8.v.2005 (W. Steiner); [PCYU]

Taxonomy. Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *cephalotes* (description, misdet.).

Diagnosis. Female *L. rozeni* can be recognised by the following diagnostic combination: head wider than mesosoma (Fig. 181); gena wider than eye; labrum with weak basal tubercle, apical process flat, dorsal keel absent; mandible narrow without preapical tooth; pronotal ridge sharply angled and dorsolateral angle acute to orthogonal (Fig. 181); scopa absent; and metapostnotum rugoso-carinulate. (Fig. 181) They are most similar to *L. platyparium* and *L. cephalotes*. Female *L. platyparium* have a strong basal tubercle on the labrum and a wide mandible that only converges to a point near the apex. Female *L. cephalotes* also have a wide mandible and metapostnotum smooth with rugae if present limited to base.

Male *L. rozeni* can be recognised by the following diagnostic combination: head wide, lower paraocular area with very dense tomentum (Fig. 182B), and pronotal collar strong. They are similar to *L. platyparium*, which has less dense facial tomentum and pronotal collar weak.

Description. FEMALE. Length 4.76–4.88 mm; head length 1.44–1.73 mm; head width 1.82–1.85 mm; forewing length 3.90–4.03 mm.

Colouration. Head and mesosoma very dull metallic greenish blue, nearly brown. Clypeus with apical 2/3 blackish brown. Antenna dark brown, flagellum with ventral surface reddish. Tegula pale translucent amber. Wing membrane subhyaline, venation and pterostigma amber. Legs brown, except tarsi reddish to brownish yellow. Metasoma reddish brown, terga and sterna with apical margins pale translucent brownish yellow.

Pubescence. Dull white. Sparse. Head and mesosoma with moderately sparse woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Face without tomentum. Frons and upper paraocular area with moderately dense hairs, most apparent when viewed from below. Pronotal collar without dense tomentum. Propodeum with sparse plumose hairs on lateral and posterior surfaces (2–2.5 OD). Mesofemoral and mesotibial combs dense but short relative to non-parasitic species. Metafemoral scopa reduced relative to nest-building species, only a few elongate hairs curved onto ventral surface. Penicillus reduced to a few thick bristles. Metasomal terga with moderately sparse, fine hairs. T1 acarinarial fan visible only as a few appressed lateral hairs. T2–T3 basolaterally and T4 entirely with scattered tomentum. T3–T4 with moderately dense elongate hairs. Sternal hairs, subappressed, not arranged as scopa (2–3 OD).

FIGURE 181. *Lasioglossum rozeni* Gibbs female, dorsal view of mesosoma. (Modified from Gibbs 2010b).

Surface sculpture. Face weakly imbricate, punctation extremely fine. Clypeus polished, punctation sparse (i=1–3d). Supraclypeal area with punctation sparse (i=1–6d). Lower paraocular and antennocular areas with punctation moderately dense (i=1–1.5d). Upper paraocular area and frons punctation dense (i<d). Ocellocular area punctation dense (i=d). Gena and postgena carinulate. Mesoscutum polished, punctation fine, sparse between parapsidal lines (i=1.5–4d), moderately dense laterad of parapsidal lines (i=1–1.5d) and dense on anterolateral portion (i≤d). Mesoscutellum similar to mesoscu-

tum, punctation sparse (i=1–3d). Axilla punctate. Metanotum weakly imbricate. Preëpisternum and hypoepimeral area imbricate. Mesepisternum dorsal half weakly rugulose, ventral half imbricate. Metepisternum with upper two-fifths weakly carinulate and ventral portion imbricate. Metapostnotum irregularly carinulate. Propodeum with dorsolateral slope imbricate, lateral and posterior surfaces tessellate. Metasomal terga polished except apical impressed areas weakly coriarious, punctation uniformly close (i=1–1.5d), except apical impressed area nearly impunctate.

FIGURE 182. *Lasioglossum rozeni* Gibbs male, (A) lateral habitus, (B) face. Scale bars = 1 mm. (Modified from Gibbs 2010b).

FIGURE 183. *Lasioglossum rozeni* Gibbs male, dorsal view of mesosoma. (Modified from Gibbs 2010b).

Structure. Head enormous, very wide (length/width ratio = 0.78–0.82). Eyes subparallel (UOD/LOD ratio = 1.00–1.02). Labrum enlarged and flattened without distinct basal tubercle, apical process flat and wide without dorsal keel (Fig. 6B). Mandible large, scythe-like, without preapical tooth, very narrow, tapering evenly to apex reaching to opposing mandibular base. Clypeus 1/5 below suborbital line, apicolateral margins convergent. Antennal sockets distant (IAD/OAD = 0.8). Frontal line carinate, ending >2 OD below median ocellus. IOD less than OOD. Median ocellus at upper ocular tangent. Gena huge, one and half times as wide as eye. Hypostomal carinae divergent towards mandible. Pronotal

dorsolateral angle acute (Fig. 181). Pronotal ridge angled, uninterrupted. and protrochanter unmodified. Basitibial plate lower carinae absent. Inner metatibial spur pectinate with 3–4 short teeth. Metapostnotum truncate (MMR ratio = 1.41–1.50), posterior margin weakly angled onto posterior surface. Propodeum with oblique carina very weak, lateral carina short, not reaching dorsal margin. T5 medial specialized area reduced in size relative to non-parasitic species.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 5.80 mm; head length 1.38–1.58 mm; head width 1.49–1.70 mm; forewing length 4.03 mm.

Colouration. Flagellum with ventral surface reddish brown. Tegula translucent brownish yellow. Legs brown, except tibial bases and apices, and tarsi brownish yellow.

Pubescence. Face with sparse tomentum. Lower paraocular area with dense tomentum obscuring surface. Gena without tomentum. S2–S5 apicolateral portions with sparse plumose hairs (1 OD).

Surface sculpture. Clypeus uniformly punctate (i=1–1.5d). Supraclypeal area with punctation sparse (i=1–3d). Metanotum rugose. Metapostnotum completely rugoso-carinulate. Propodeum with dorsolateral slope rugose. Metasomal terga polished, punctation uniform (i=1.5–2d) except apical impressed areas impunctate.

Structure. Head wide (length/width ratio = 0.93). Eyes convergent below (UOD/LOD ratio = 1.27–1.34). Clypeus 1/2 below suborbital tangent, apicolateral margins subparallel. Antennal sockets distant (IAD/OAD > 1.7). Frontal line carinate, ending 2 OD below median ocellus. IOD subequal to OOD. Pedicel shorter than F1. F2 length 1.7–1.8X F1. F2–F10 moderately elongate (length/width ratio = 1.43–1.55). Hypostomal carinae weakly divergent. Metapostnotum moderately elongate (MMR ratio = 1.29–1.35), posterior margin weakly angled onto posterior surface.

Terminalia. S7 with medial lobe wide, acuminate, apex rounded. S8 with apicomedial margin strongly convex. Genital capsule as in Fig. 184. Gonobase with ventral arms thick, widely separated. Gonostylus small, dorsal setae elongate. Retrorse lobe elongate, weakly attenuated, reflexed apically.

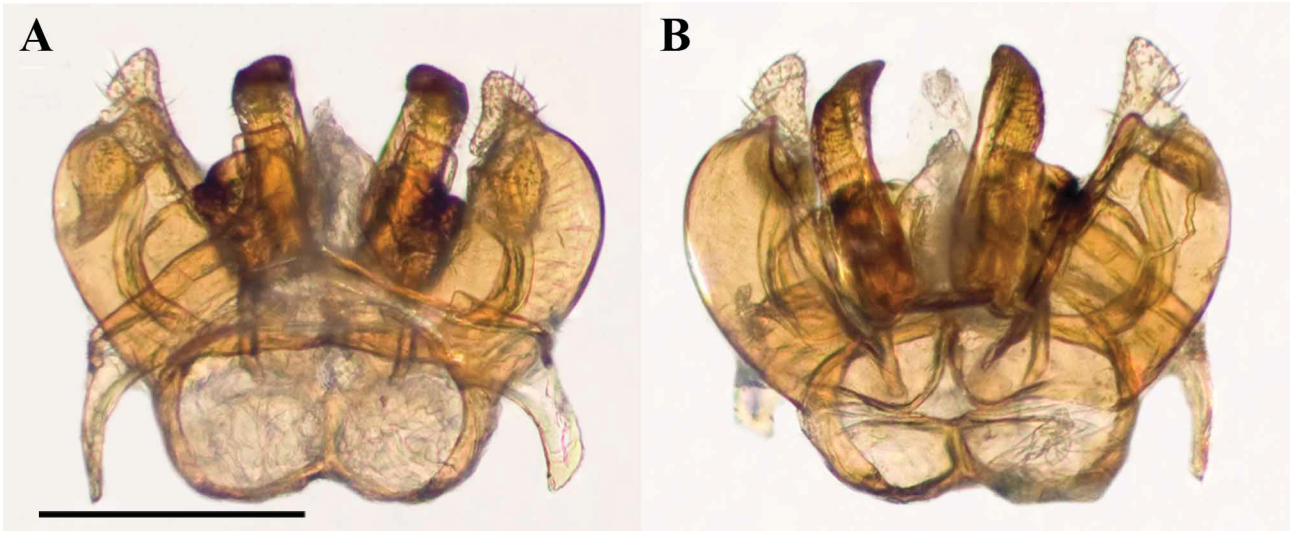

FIGURE 184. *Lasioglossum rozeni* Gibbs, new species male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm. (Modified from Gibbs 2010b).

Range. North Carolina, west to Mississippi and Minnesota (Fig. 185). **USA:** IL, MA, MD, NY, VA, WV.

Paratypes. USA: ILLINOIS: 1♀ Hancock Co., N40.3672 W091.4076, 22.viii.2010 (R. Geroff); MARYLAND: 1♂ Pr. George's Co., N39.0352 W076.8739, 21.vii.2004 (S. Kolski); 1♀ Pr. George's Co., N39.0568 W076.8143, 2–3.x.2002 (E.J. Jackson); 4♀♀ Talbot Co., N38.8 W.076.2833, 7–8.v.2005 (W. Steiner); [PCYU]; 1♀ Montgomery Co., N39.085 W77.0067, 5–7.iv.2010 (J. Whitaker); 1♀ Talbot Co., N38.8 W.076.2833, 7–8.v.2005 (W. Steiner); [CUIC]; MASSACHUSETTS: 1♂ Worcester Co., sand pit, 1.6 mi SW of Lake Denison, 1.ix.2006 (M.F. Veit); [PCYU]; NEW YORK: 4♂♂ Suffolk Co., Gardiners I., 19.viii.2007 (R.G. Goelet); [AMNH]; VIRGINIA: 1♀ Loudoun Co., BRNP, N39.0283 W77.595. 22.viii.2010 (M. Irwin, R. Circe); [CUIC]; WEST VIRGINIA: 1♀ Hampshire Co., Capon Bridge, Buffalo Gap Camp, 20.vii.2001 (S. Droege); [PCYU]; 2♀♀ Hampshire Co., N39.2315 W78.4638, 23.viii.2009 (S.W. Droege); 1♀ Hampshire Co., Lehew 16.viii.2011 (S. Droege); 2♀♀ Hampshire Co., Lehew 17.viii.2011 (S. Droege); 1♀ Hardy Co., N39.0942 W78.5615, 1–11.iv.2010 (J. Whitaker); 1♀ Randolph Co., N38.8528 W79.5293, 11.iv.2010 (J. Whitaker); [CUIC].

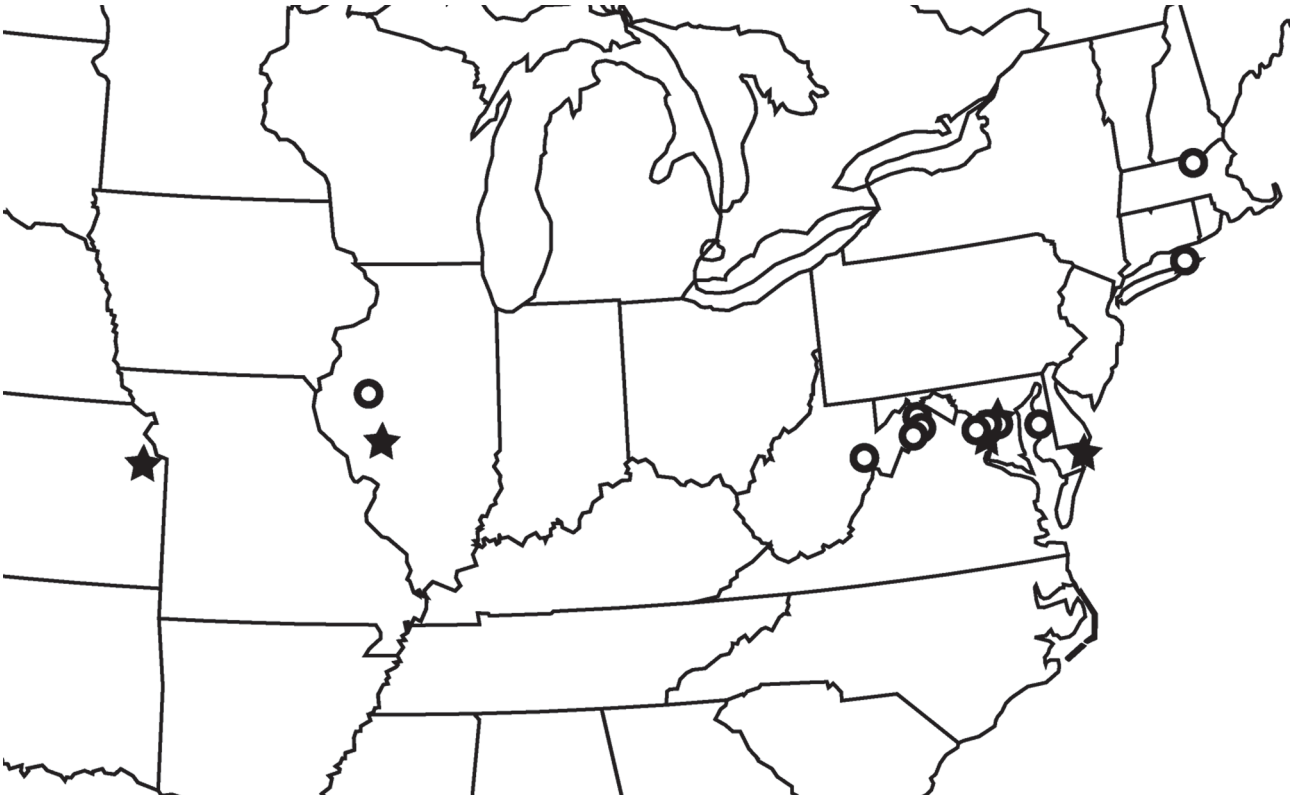

FIGURE 185. Distribution map of *Lasioglossum rozeni* (circles) and *L. simplex* (stars).

Floral records. ASCLEPIADACEAE: *Cynanchum leave*, ASTERACEAE: *Cirsium*, *Leucanthemum*, *Solidago*, CORNACEAE: *Cornus*, SALICACEAE: *Salix nigra*.

Etymology. The species is named in honour of Jerome Rozen, Jr. for his many studies of cleptoparasitic bees.

Biology. Robertson, 1901: (possible host); Robertson, 1926: (possible host); Michener, 1978: (possible host).

Comments. Uncommon.

Lasioglossum rozeni is believed to be a social parasite or cleptoparasite of nest-building *L.* (*Dialictus*).

Lasioglossum (*Dialictus*) *rufulipes* (Cockerell)

(Figures 186–190)

Halictus (*Chloralictus*) *rufulipes* Cockerell, 1938: 3. ♀.

Holotype. ♀ CANADA, Saskatchewan, Lake Waskesiu, beginning of portage to Heart Lakes, 31.viii.1936, (T. & W. Cockerell); [AMNH]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *rufulipes*, p. 1117 (catalogue); Knerer and Atwood, 1964: *Dialictus sandhouseae* ♀, p. 7 (description, misdet.); Hurd, 1979: *Dialictus rufulipes*, p. 1971 (catalogue); Moure & Hurd, 1987: *Dialictus rufulipes*, p. 128 (catalogue); *Lasioglossum* (*Evylaeus*) *rufulipes*, p. 15 (tax. notes).

Diagnosis. Both sexes of *L. rufulipes* can be distinguished from all *Lasioglossum* North of Mexico by the following diagnostic combination: head and mesosoma metallic; mesoscutal punctation fine, sparse between parapsidal lines; metapostnotum nearly as long as mesoscutellum; lateral and posterior propodeal surfaces completely separated by lateral carina (as in Figs. 1, 28B); oblique carina strong; and metasomal terga brown with reddish brown highlights. Female *L. rufulipes* can be further distinguished by T1 acarinarial fan absent (Fig. 187) and T4 with moderately sparse tomentum. Male *L. rufulipes* can be further distinguished by labrum, mandible and distal half of clypeus yellow (Fig. 188B), mesepisternum impunctate, gonobase ventral rim entire (Fig. 190A), and retrorse lobe narrow. *Lasioglossum testaceum* is most similar but can be distinguished by metasomal terga yellow-orange in females (Fig. 213A) and fine mesepisternal punctation of males.

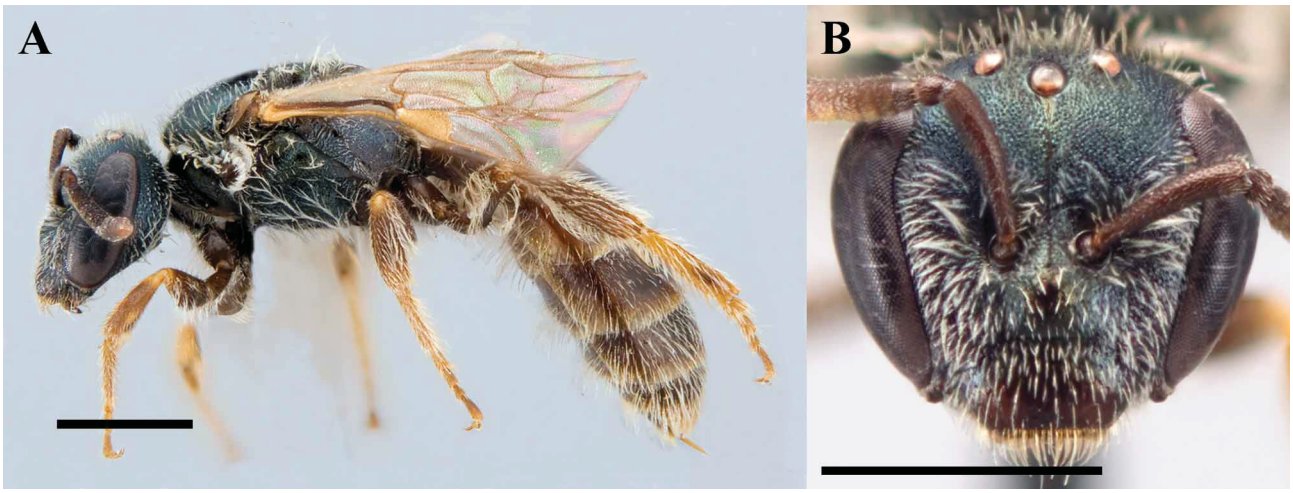

FIGURE 186. *Lasioglossum rufulipes* (Cockerell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Redescription. FEMALE. Length 5.12–5.31 mm; head length 1.37–1.46 mm; head width 1.51–1.56 mm; forewing length 4.03–4.33 mm.

Colouration. Head and mesosoma pale, golden green with bluish to purplish reflections on the face and mesopleuron. Labrum reddish brown. Mandible yellow to yellowish brown, apex red, base blackish brown. Clypeus with apical half reddish brown, basal half, and supraclypeal area bronze. Antenna brown, F3–F10 with ventral surface brownish yellow. Tegula brownish yellow to reddish brown. Wing venation and pterostigma amber to brownish yellow. Wing membrane faintly dusky. Legs brown, except tibial base, protibial anterior face, metabasitarsus, meso- and distitarsi brownish yellow. Propodeum dorsal surface purplish. Metasoma reddish brown, terga and sterna with apical margins translucent brownish yellow.

Pubescence. Dull white. Sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (1.5–2.5 OD). Face with sparse subappressed tomentum not obscuring surface. Gena without tomentum. Pronotal lobe and dorsolateral angle with dense tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (1.5–2 OD). Metasomal terga with sparse fine hairs. T1 acarinarial fan absent. T1 with erect hairs (1 OD) only. T3 with narrow basal fasciae of appressed tomentum. T3–T4 apical margins very with very sparse apical fringes.

Surface sculpture. Face imbricate, punctation fine, shallow. Clypeus weakly imbricate, punctation moderately sparse (i=1–2d). Supraclypeal area moderately dense (i=1–1.5d). Lower paraocular area with punctation dense, obscure (i≤d). Antennocular area with punctation sparse (i=1–3d). Upper paraocular area and frons punctate-reticulate. Ocellocular area punctation obscure, minute (i≤d). Gena and postgena lineolate. Mesoscutum imbricate, punctation very fine and shallow, moderately sparse between parapsidal lines (i=1–2d), moderately dense laterad of parapsidal lines (i=1–1.5d), anterolateral portions obscurely, contiguously punctate. Mesoscutellum similar to mesoscutum, submedial punctation moderately dense (i=1–1.5d). Axilla punctate. Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate, obscurely punctate. Mesepisternum upper half rugulose, lower half tessellate-imbricate. Metepisternum with upper half rugoso-carinulate, lower half imbricate. Metapostnotum anastomosing rugose. Propodeum with dorsolateral slope weakly imbricate, lateral surface tessellate, posterior surface tessellate-imbricate. Metasomal terga weakly coriarious, T1 virtually impunctate, T2–T4 punctation on basal half sparse, obscure (i=2–4d), apical half impunctate (except along premarginal line).

Structure. Head wide (length/width ratio = 0.90–0.94). Eyes weakly convergent below (UOD/LOD ratio = 1.14–1.19). Clypeus ½ below suborbital tangent, apicolateral margins strongly convergent. Antennal sockets somewhat distant (IAD/OAD > 0.6). Frontal carina ends 2 OD from median ocellus. IOD greater than OOD. Hypostomal carinae parallel. Pronotum with dorsolateral angle obtuse. Pronotal ridge broadly rounded, interrupted by oblique sulcus. Mesoscutum with anteromedial margin very weakly emarginate. Tegula ovoid. Procoxa and protrochanter unmodified. Inner metatibial spur pectinate with 4–5 short, narrow branches (not including apex of rachis). Metapostnotum lunate, elongate (MMR = 1.12–1.21), posterior margin narrowly rounded onto posterior surface. Propodeum strongly carinate, lateral carina reaching dorsal margin.

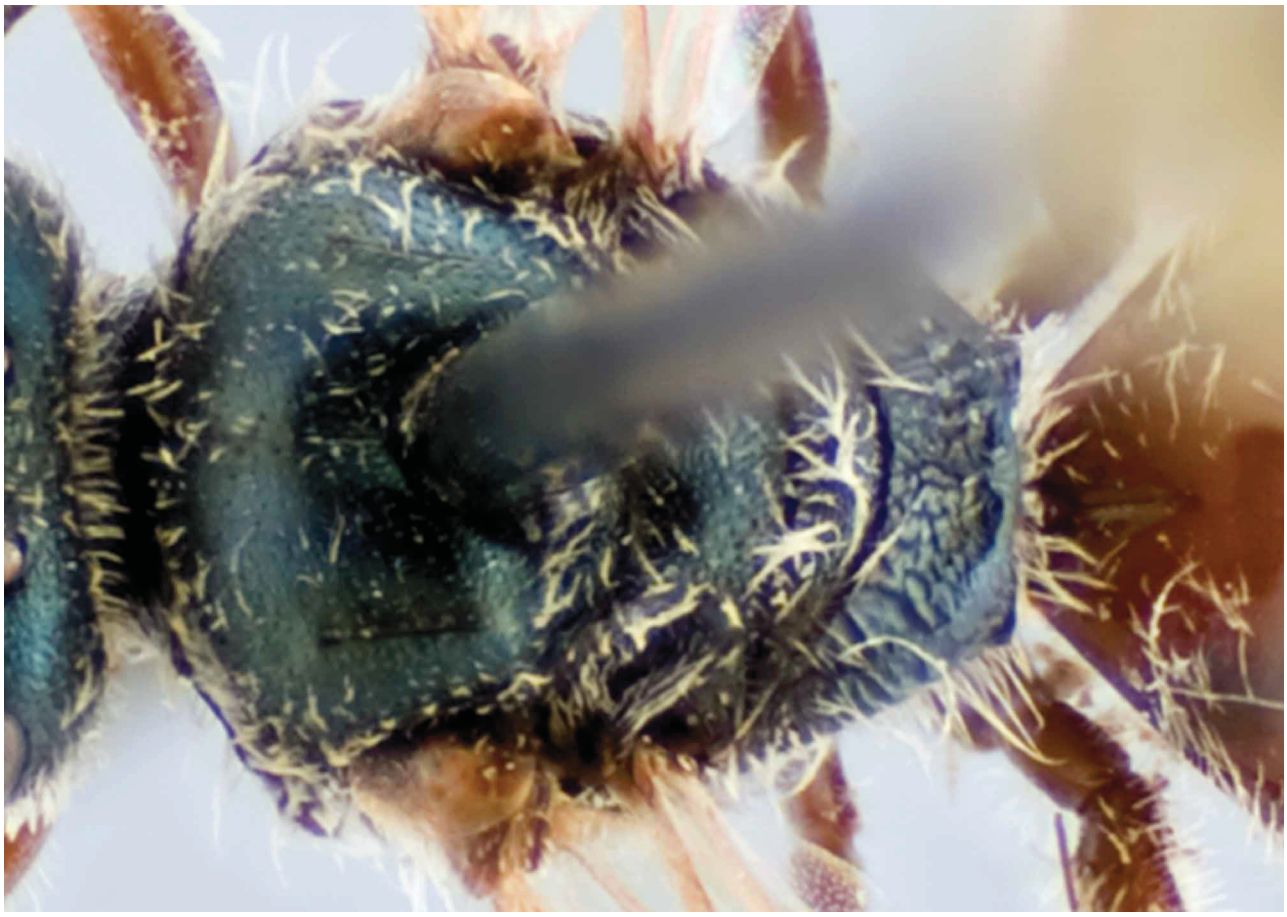

FIGURE 187. *Lasioglossum rufulipes* (Cockerell) female, dorsal view of mesosoma.

FIGURE 188. *Lasioglossum rufulipes* (Cockerell) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 5.49–5.61 mm; head length 1.37–1.44 mm; head width 1.44–1.51 mm; forewing length 4.27–4.33 mm.

Colouration. Head and mesosoma bluish green. Labrum, mandibles, and clypeus distal half pale yellow, clypeus yellow mark extending upward along midline. Flagellum with ventral surface pale brownish yellow. Legs brown, except pro- and mesotibia mostly brownish yellow, outer surfaces with elongate central brown area, tarsi and metatibial base and apex extensively pale brownish yellow. Metasoma brown, infused with brownish red.

Pubescence. Dull white. Sparse. Lower paraocular area with appressed tomentum obscuring surface. Upper clypeus and lower supraclypeal area with scattered plumose hairs. S2–S5 with sparse apical fringes.

FIGURE 189. *Lasioglossum rufulipes* (Cockerell) male, dorsal view of mesosoma.

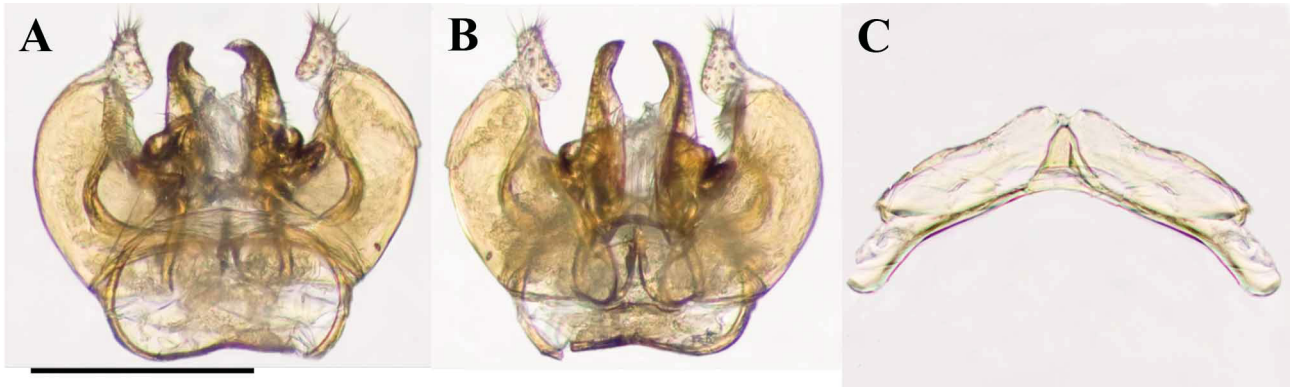

FIGURE 190. *Lasioglossum rufulipes* (Cockerell) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

Surface sculpture. Ocellocular area rugulose. Lower surface of mesepisternum obscurely punctate (i=1–2d). Propodeum dorsolateral slope, posterior portion of lateral surface of propodeum, and posterior surface of propodeum strongly rugose. T1–T2 polished, remainder of metasomal terga weakly coriarious. Metasomal terga punctation sparse on basal half (i=1–4d), apical half impunctate (except along premarginal line).

Structure. Head wide (length/width ratio = 0.95–0.97). Eyes strongly convergent below (UOD/LOD ratio = 1.44–1.54). Clypeus 2/3 below suborbital tangent, apicolateral margins convergent. Antennal sockets distant (IAD/OAD > 1.8). Pedicel shorter than F1. F2 length 1.9–2.2X F1. F2–F10 elongate (length/width ratio = 1.63–1.93). Metapostnotum moderately elongate (MMR = 1.16–1.20), posterior margin sharply angled onto posterior propodeal surface.

Terminalia. S7 with median lobe short, acuminate, apex narrowly rounded (Fig. 190C). S8 with apical margin weakly convex (Fig. 190C). Genital capsule as in Fig. 190A, B. Gonobase with ventral arms connected. Gonostylus

small, covered with fine hairs, dorsal setae elongate. Retrorse lobe narrow, parallel-sided, covered with fine hairs. Penis valve narrow apically.

Range. Quebec west to Alberta, Yukon Territory, south to Minnesota (Fig. 191). **USA:** MI, MN. **CANADA:** AB, MB, NT, ON, PQ, YT.

Additional material examined. CANADA: ALBERTA: 35♀♀ Waterton, 8.vi.1962 (K.C. Herman); 1♀ Waterton, 24.vi.1962 (W.R.M. Mason); 3♀♀ 8 mi E Morley, 26.vi.1962 (K.C. Herman); 1♂ 15 mi E Morley, 10.vii.1962 (K.C. Herman); 4♀♀ Twin Butte, 10.vi.1962 (K. Herman); [CNC]; 1♀ Barrier Lake, 22.v.1988 (L. Packer); [PCYU]; 2♀♀ Edmonton, 25.v.1986 (D. Blades); 2♀♀ Fort MacKay: bridge, riparian forest hillside, 5.v.1979 (G.J. Hilchie & J.K. Ryan); 1♂ Thickwood Hills road, 22.viii.1978 (J.K. Ryan & G.J. Hilchie); [PMAE]; MANITOBA: 1♀ Gillam, 20.vi.1950 (J.F. McAlpine); 1♀ Gillam, 19.vii.1950 (J.F. McAlpine); 3♂♂ Turtle Mt., 22.vii.1953 (Brooks & Kelton); [CNC]; NORTHWEST TERRITORIES: 2♀♀ Normal Wells, 9.vi.1949 (W.R.M. Mason); [CNC]; 1♀ Mackenzie Dist., Norman Wells, N65°15′15″ W126°41′15″, 22.viii–1.ix.2005 (D. Currie & R. Popko); [ROM]; ONTARIO: 1♀ Cane, 22.vi.1961 (G. Knerer); 1♂ Upsala, 14.viii.1962 (G. Knerer); [BMNH];1♀ Upsala, 14.viii.1962 (G. Knerer); 1♀ Upsala, 18.viii.1962 (G. Knerer); 1♂ Black Sturg. Lake, 1–15.viii.1956 (Linberg); [CUIC]; 7♂♂ 3♀♀ (1 stylopized), Upsala, 14.viii.1962 (G. Knerer); 2♀♀ Cane, 22.vi.1961 on *Salix*, (G. Knerer); 7♀♀ Kirkland Lake, 21.vi.1961 on *Salix*, (G. Knerer); 2♂♂ Torquis, 10.viii.1961 (G. Knerer); 1♀6♂ Hearst, 17.viii.1963 (G. Knerer); 1♂ Kabinakagami R., 17.viii.1963 (G. Knerer); [ROM]; QUEBEC: 1♀ W of Normandin, N48°51′38.9′′ W72°37′0.9′′, 180 m, 8.vi.2009 (M. Chagnon); [PCYU]; YUKON TERRITORY: 3♀♀ 19♂♂ Dawson, 1100 ft., 18.viii.1949 (P.F. Bruggemann); [CNC]; 4♂♂ Julie's farm, 4.viii.1992 (J. Taylor); [PCYU]; **USA:** MICHIGAN: 1♂ Michigamme, 8.viii.1936 (C. Sabrosky); [NMNH]; MINNESOTA: 1♀ Beltram Co., Kelliher, 2.viii.1951 (R.L. Fischer); [CUIC].

Floral records. APOCYNACEAE: *Apocynum androsaemifolium*, ASTERACEAE: *Anaphalis*, *Solidago*, ONAGRACEAE: *Epilobium*, ROSACEAE: *Potentilla*, *Prunus*, *Spiraea*, SALICACEAE: *Salix*.

Comments. Uncommon. This is evidently a boreal species.

Lasioglossum rufulipes and *L. testaceum* were excluded from the revision of Canadian *L.* (*Dialictus*) based on an unpublished morphological study which suggested these two species belonged in the subgenus *L.* (*Evylaeus*). In particular, the shape of the genital capsule appears more similar to those of *L.* (*Evylaeus*). Now, based on additional unpublished molecular phylogenetic results, it is evident this subgeneric change was premature and additional study is required. The two species are included here in the subgenus *Dialictus*, following traditional usage, until the subgeneric limits of *Dialictus* and *Evylaeus* are stabilized.

Knerer and Atwood (1964) incorrectly referred to the female of *L. rufulipes* using the epithet *sandhouseae* Michener (as *D. sandhouseae*). For additional, information see the comment for *L. testaceum* below.

Lasioglossum (*Dialictus*) *sagax* (Sandhouse)

Halictus (*Chloralictus*) *sagax* Sandhouse, 1924: 25.

Holotype. ♂ USA, Colorado, Boulder, 28.vii.1908 (S.A. Rohwer); [NMNH: 26422]. Examined.

Halictus (*Chloralictus*) *accentus* Sandhouse, 1924: 38.

Holotype. ♂ USA, Colorado, Boulder, University of Colorado Campus, 1.viii.1908 (S.A. Rohwer); [NMNH: 26442]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *accentum*, p. 1111, *L.* (*C.*) *sagax*, p. 1117 (catalogue); Hurd, 1979: *Dialictus accentus*, p. 1963, *D. sagax*, p. 1971 (catalogue); Moure & Hurd, 1987: *Dialictus accentus*, p. 87, *D. sagax*, p. 128 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *sagax* ♀♂, p. 286 (redescription, key, synonymy).

Diagnosis. Female *L. sagax* can be recognised by the following diagnostic combination: supraclypeal area densely punctate; mesoscutum imbricate, punctures moderately sparse and deep between parapsidal lines (i=1–2d); mesepisternum rugulose; metapostnotum coarsely rugose, reaching posterior margin; T1 polished; acarinarial fan with dorsal opening; T1 dorsally and T2 apicomedially with sparse punctures; metasomal terga brown; T2 basolaterally and T3–T4 entirely with moderately abundant tomentum; and T3–T4 with dense apical fringes. They are most similar to *L. admirandum* and *L. ephialtum*. Female *L. admirandum* have distinct punctures on dorsal surface of T1 and apicomedial portion of T2. Female *L. ephialtum* have moderately sparse apical fringes on T3–T4 and mesoscutal punctures shallow between parapsidal lines.

FIGURE 191. Distribution map of *Lasioglossum rufulipes* (stars) and *L. testaceum* (circles).

Male *L. sagax* are similar to females but may be further distinguished by clypeus with distal yellow maculation, facial pubescence dense obscuring the surface below, tibiae and tarsi mostly brownish yellow, mesoscutum moderately polished due to lack of microsculpture, and metasomal terga brown with apical halves impunctate. They are most similar to *L. admirandum*, which has the mesoscutum dull due to microsculpture.

Range. Nova Scotia, west to Alberta, south to Colorado (Fig. 201). **USA**: CO, WI. **CANADA**: AB, BC, MB, NS, SK.

DNA Barcode. Available. Multiple haplotypes.

Comments. Common. Recorded in the eastern United States from Wisconsin (Wolf & Ascher 2009). This species belongs to the *L. viridatum* species-group. DNA barcodes suggest *L. sagax* may be a species-complex but additional study is required.

Lasioglossum (*Dialictus*) *sheffieldi* Gibbs

Lasioglossum (*Dialictus*) *sheffieldi* Gibbs, 2010b: 302. ♀♂.

Holotype. ♀ CANADA, Nova Scotia, Kings Co., Avonport, N45.1198 W064.2730, 18.vii.2002 (C. Sheffield); [PCYU].

Diagnosis. Female *L. sheffieldi* can be recognised by the following diagnostic combination: head moderately long (length/width ratio = 1.00–1.01); mesoscutum tessellate, punctures dense except medially (Fig. 13B); mesepisternum shining, irregularly punctate; metapostnotum with strongly anastomosing rugae; T1 acarinarial fan complete dorsally;

metasomal terga polished with faint metallic reflections; and T3–T4 with moderately dense tomentum. They are similar to *L. perpunctatum*, which has a wider head (length/width ratio = 0.95–0.96) and dense mesoscutal punctures medially (Fig. 13A).

Male *L. sheffieldi* can be recognised by the following diagnostic combination: head long (length/width ratio = 1.06–1.08), dense facial tomentum limited to lower paraocular area, flagellomeres relatively short (length/width ratio = 1.20–1.62), mesoscutal punctures sparse between parapsidal lines (i=1–3d), mesepisternum with distinct punctures, tegula with weak posterior angle, and apical impressed areas of metasomal terga pale translucent yellow, distinctly punctate. They are similar to *L. perpunctatum*, which has a wider head (length/width ratio = 1.00–1.03).

Range. Coastal dunes of Nova Scotia, southern Newfoundland, west to Quebec. Disjunct individuals from western coast of Lake Michigan and Manitoba dunes. **USA**: WI. **CANADA**: MB, NB, NF, NS, PQ.

DNA Barcode. Available. Multiple sequences.

Comments. Locally common. *Lasioglossum sheffieldi* is a sand dune specialist.

Lasioglossum (*Dialictus*) *simplex* (Robertson)

(Figures 192–196)

Paralictus simplex Robertson, 1901: 230. ♀.

Lectotype. ♀ USA, Illinois, Macoupin Co., Carlinville, 17.iv.1893 (C. Robertson); [INHS: 13817] by W. E. LaBerge (in Webb 1980). Examined.

Halictus (*Chloralictus*) *malinus* Sandhouse, 1924: 40. ♂. **[new synonymy]**

Holotype. ♂ USA, Virginia, East Falls Church, 16.vii., on *Daucus carota* (S.A. Rohwer); [NMNH: 26445]. Examined. [gynandromorph]

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *malinum*, p. 1115, *L.* (*P.*) *simplex*, p. 1119 (catalogue); Mitchell, 1960: *Paralictus simplex*, p. 449 (redescription); Hurd, 1979: *Dialictus malinus*, p. 1968 (catalogue); Moure and Hurd, 1987: *Dialictus malinus*, p. 111, *Paralictus simplex*, p. 143 (catalogue).

Diagnosis. Female *L. simplex* can be recognised as a parasitic *Dialictus* by head wide (length/width ratio = 0.84–0.86) (Fig. 192B); mandible without preapical tooth; labrum with apical process flat, dorsal keel absent (Fig. 6B); and scopal hairs weak. They may be further distinguished by mandible relatively short, not extending beyond opposing clypeal angle; gena subequal in width to eye; and pronotal ridge rounded. Female *L. simplex* is most similar to *L. furunculum*, *L. izawsum,* and *L. sitocleptum* Gibbs, all of which have the pronotal ridge carinate. Female *L. izawsum* have a distinct preapical tooth.

Male *L. simplex* can be recognised by the combination of face with dense subappressed tomentum (Fig. 194B); flagellomeres short (length/width ratio = 1.40–1.58); mesoscutum polished, punctures fine and sparse between parapsidal lines (i=1–2d) (Fig. 195); metapostnotum with anastomosing rugae, posterior margin narrowly rounded; and metasomal terga with apical impressed areas nearly impunctate with a few scattered punctures.

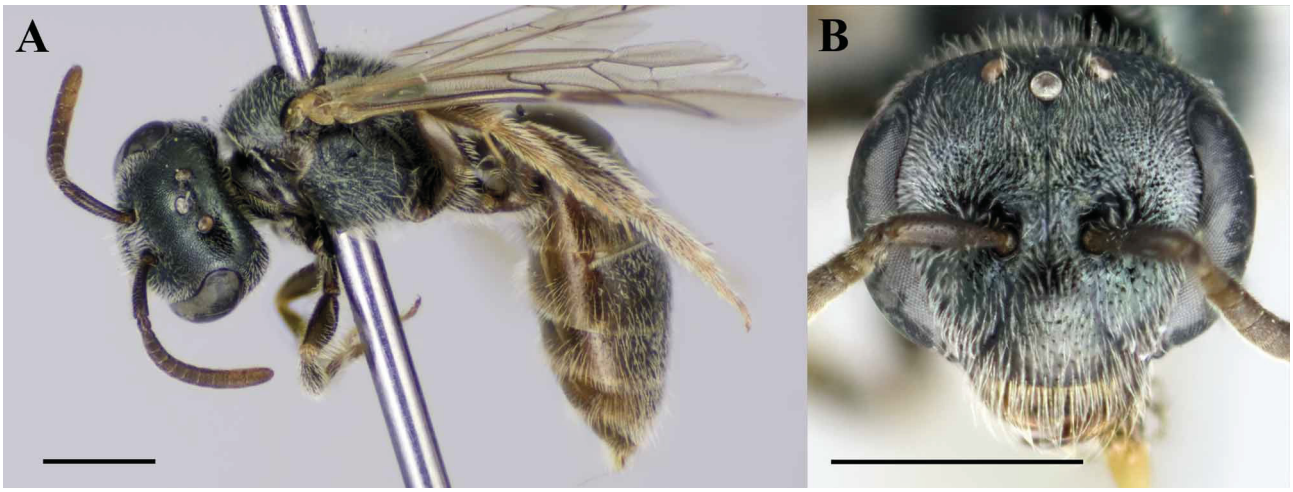

FIGURE 192. *Lasioglossum simplex* (Robertson) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 193. *Lasioglossum simplex* (Robertson) female, dorsal view of mesosoma.

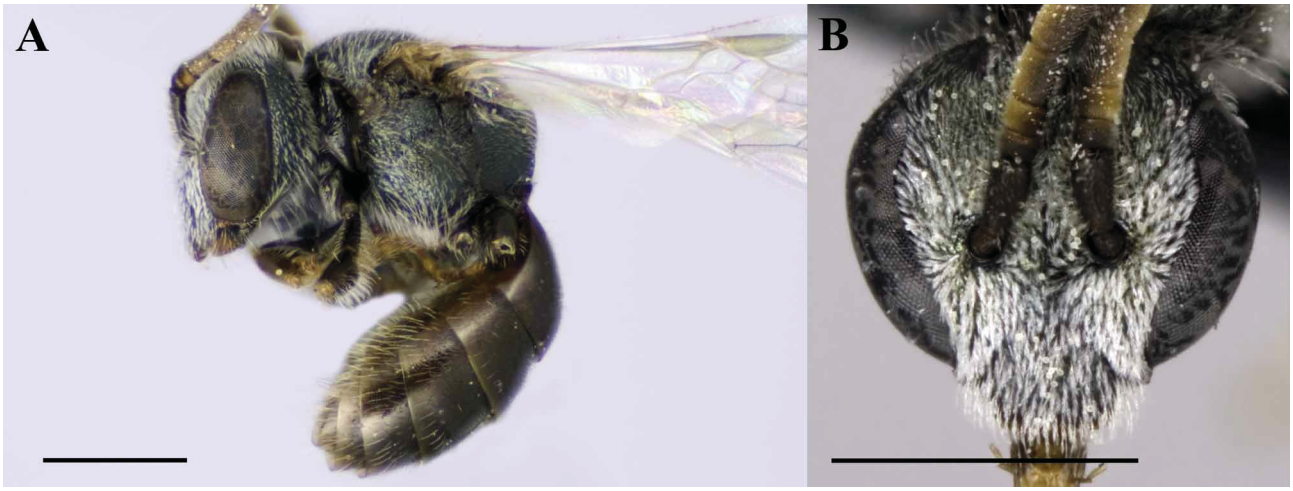

FIGURE 194. *Lasioglossum simplex* (Robertson) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Description. FEMALE. Length 5.32–5.63 mm; head length 1.49–1.51 mm; head width 1.73–1.80 mm; forewing length 3.51–3.93 mm.

Colouration. Head and mesosoma bluish green. Clypeus with apical 1/2 blackish brown. Antenna dark brown, F8–F10 with ventral surface orange-yellow. Tegula amber. Wing venation and stigma dark yellowish brown. Legs brown, except tarsi reddish brown. Metasoma dark brown, terga and sterna with apical margins translucent brownish yellow.

FIGURE 195. *Lasioglossum simplex* (Robertson) female, dorsal view of mesosoma.

Pubescence. Dull white. Sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Face without appressed hairs. Pronotal collar without dense tomentum. Propodeum with moderately sparse plumose hairs on lateral and posterior surfaces (1.5–2 OD). Mesofemoral and mesotibial combs dense but short relative to non-parasitic species. Metafemoral scopa reduced relative to nest-building species, only a few elongate hairs curving above ventral surface. Penicillus greatly reduced, indistinguishable from other hairs. Metasoma moderately sparse, fine hairs. T1 acarinarial fan sparse, incomplete with dorsal opening greater than width of lateral appressed hair patches. T2–T3 basolaterally and T4 entirely with very sparse tomentum. T2 apicolateral and T3–T4 apical margins with very sparse fringes. Sternal hairs erect, posteriorly directed (1.5–2 OD).

Surface sculpture. Face polished, weakly imbricate, punctation fine. Clypeus polished, punctation sparse (i=1–4d). Supraclypeal area with punctation moderately sparse (i=1–3d). Lower paraocular and antennocular areas with punctation moderately sparse (i=1–2d). Upper paraocular area and frons reticulate-punctate. Ocellocular area polished, punctate (i=1–2d). Gena faintly lineolate. Postgena imbricate. Mesoscutum weakly imbricate, more polished posteriorly, punctation fine, sparse between parapsidal lines (i=1–2.5d), moderately sparse laterad of parapsidal line (i=0.5–1.5d) and dense on anterolateral portion (i≤d). Mesoscutellum similar to mesoscutum, submedial punctation sparse (i=1–3d). Axilla punctate. Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area ruguloso-imbricate. Mesepisternum upper half rugulose, lower half imbricate. Metepisternum with upper 1/3 carinulate, lower 2/3 imbricate. Metapostnotum completely rugoso-carinulate, posterior margin imbricate. Propodeum with dorsolateral slope carinulate, lateral surface imbricate, posterior surface imbricate-tessellate. Metasomal terga polished except apical impressed areas faintly coriarious, punctation on basal halves moderately sparse (i=1–2.5d), apical half sparse (i=2.5–4d).

Structure. Head very wide (length/width ratio = 0.84–0.86). Eyes convergent below (UOD/LOD ratio = 1.25–1.26). Labrum enlarged and flattened with distinct basal tubercle, apical process without dorsal keel. Mandibles slender without preapical tooth. Clypeus 1/3 below suborbital tangent, apicolateral margins strongly convergent. Antennal sockets distant (IAD/OAD > 0.8). Frontal line carinate, ending 2 OD below median ocellus. IOD subequal to OOD. Gena subequal to eye. Pronotal dorsolateral angle obtuse. Pronotal ridge broadly rounded, interrupted by oblique sulcus. Basitibial plate with lower carina weak. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum truncate (MMR ratio = 1.25),

posterior margin narrowly rounded onto posterior surface. Propodeum with oblique carina very weak, lateral carina short, not reaching dorsal margin. T5 medial specialized area reduced in size relative to non-parasitic species.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 4.30–4.72 mm; head length 1.37–1.56 mm; head width 1.46–1.58 mm; forewing length 3.03–3.75 mm.

Colouration. Mandible brownish yellow. Flagellum with ventral surface reddish. Legs brown, except tibial bases and apices, and tarsi brownish yellow.

Pubescence. Face below median ocellus with dense tomentum obscuring surface, densest on lower paraocular area. S2–S3 with dense apical subappressed hairs and S4 with apicolateral subappressed hairs.

Surface sculpture. Mesoscutum polished. Metasomal terga with apical impressed margins nearly impunctate.

Structure. Head wide (length/width ratio = 0.93–0.98). Eyes strongly convergent below (UOD/LOD ratio = 1.43–1.52). Clypeus 2/3 below suborbital line, apicolateral margins subparallel. Antennal sockets distant (IAD/OAD > 1.3). Frontal line carinate, ending <2 OD below median ocellus. Hypostomal carinae only slightly divergent towards mandibles. Pedicel shorter than F1. F2 length 1.4–1.7X F1. F2–F10 moderately elongate (length/width ratio = 1.40–1.58). Metapostnotum moderately elongate (MMR ratio = 1.18), posterior margin sharply angled onto posterior surface.

Terminalia. S7 with median lobe broadly acuminate, apex rounded (Fig. 196). S8 with apicomedial margin weakly convex (Fig. 196). Genital capsule as in Fig. 196. Gonobase with ventral arms narrowly separated. Volsella roughly ovoid. Gonostylus narrow and elongate, dorsal setae elongate. Retrorse lobe elongate, attenuated apically.

Range. Maryland west to Kansas (Fig. 185). **USA**: IA, IL, KS, MD, VA.

Additional material examined. USA: ILLINOIS: 1♂ (*Chloralictus versatus* lectoallotype), Carlinville (C. Robertson); 2♀♀ *paratypes* Carlinville (C. Robertson); [INHS]; IOWA: 1♀ Woodbury Co., Sioux City, 15.vii.1921 (C.N. Ainslie); [AMNH]; KANSAS: 2♀♀ Lawrence vicinity, 2.x.1976 (S. Laroca); [SEMC]; MARYLAND: 1♀ Pr. George's Co., N39.02788 W076.8856, 13–14.iv.2005 (S.W. Droege); 1♂ Worcester Co., N38.1616 W075.1704, 20.ix.2006 (S.W. Droege); [PCYU]; VIRGINIA: 1♂ (*H.* (*C.*) *malinus* paratype) E[ast] Falls Ch[urch], 16.vii (S.A. Rohwer); [CUIC].

Floral records. APIACEAE: *Cicuta maculata*, *Daucus carota*, *Zizia aurea*; ASTERACEAE: *Achillea millefolium*, *Solidago*; RANUNCULACEAE: *Ranunculus fascicularis*; ROSACEAE: *Rubus flagellaris*.

DNA Barcode. Available. Multiple sequences.

Comments. Rare.

Lasioglossum simplex is evidently a social parasite of *L. trigeminum* and/or *L. versatum*. There is some confusion as to which of these species was studied by Michener (1966).

The holotype of *H.* (*C.*) *malinus* is a gynandromorph. The head is clearly male and the metasoma is clearly female. The sex of the mesosoma is evidently mixed. The inner metatibial spur is serrate like a male on the right side but is pectinate like a female on the left side.

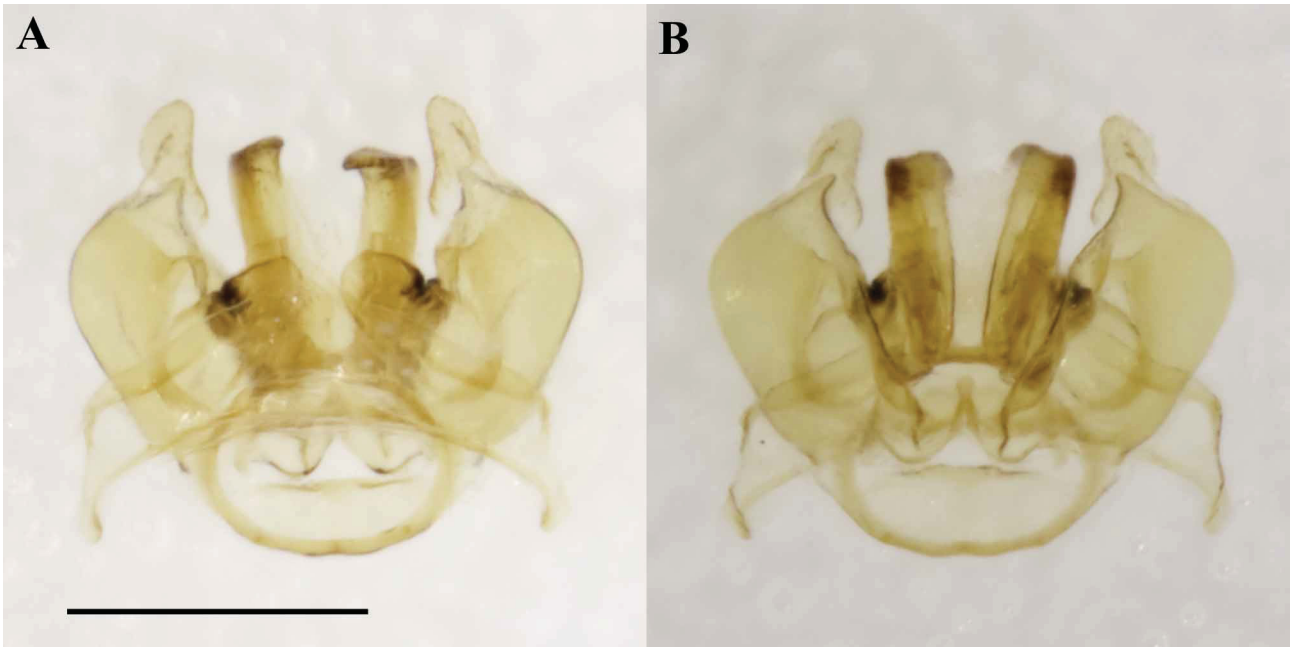

FIGURE 196. *Lasioglossum simplex* (Robertson) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

***Lasioglossum* (*Dialictus*) *smilacinae* (Robertson)**

Halictus smilacinae Robertson, 1897: 322. ♀.

Lectotype. ♀ USA, Illinois, Macoupin Co., Carlinville, 21.iii.1894 (C. Robertson); [INHS: 16247] by W. E. LaBerge (in Webb 1980). Examined.

Halictus zophops Ellis, 1914: 97. ♀. **[new synonymy]**

Holotype. ♀ USA, Colorado, Boulder, 13.iv.1913, (M.D. Ellis); [UCMC]. Examined.

Dialictus philanthanus Mitchell, 1960: 441. ♂. **[new synonymy]**

Holotype. ♂ USA, North Carolina, Mecklenburg Co., 3.vi.1957 (C.F. Smith); [NCSU]. Examined.

Taxonomy. Robertson, 1902b: *Chloralictus smilacinae*, p. 249 (key); Michener, 1951: *Lasioglossum* (*Chloralictus*) *smilacinae*, p. 1118; *L.* (*C.*) *zophops*, p. 1118 (catalogue); Mitchell, 1960: *Dialictus laevissimus*, p. (misdet., incorrect syn.) Krombein, 1967: *Lasioglossum* (*Dialictus*) *philanthanum*, p. 465 (catalogue); Hurd, 1979: *Dialictus zophops*, p. 1973 (catalogue); Moure & Hurd, 1987: *Dialictus philanthanus*, p. 122, *D. zophops*, p. 142 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *laevissimum*, p. 170 (misdet.); *L.* (*D.*) *zophops* ♀♂, p. 368 (redescription, key).

Diagnosis. Female *L. smilacinae* can be recognised by the following diagnostic combination: size large (6.1–7.1 mm); head wide (length/width ratio = 0.92–0.94); mesoscutum imbricate-tessellate, punctures sparse punctures between parapsidal lines; mesepisternum rugulose; propodeal oblique carina well-developed; T1 acarinarial fan without dorsal opening; metasomal terga brown, apical impressed areas distinctly punctate; and T2 with sparse apical fringes visible in dorsal view. Similar species include *L. gotham*. *L. laevissimum* and *L. versatum*. Female *L. gotham* have more polished integument due to weaker microsculpture, obscure mesepisternal punctures, and T1 acarinarial fan with narrow dorsal opening. Female *L. laevissimum* have apical halves of metasomal terga impunctate and T2 lacks apical fringes visible in dorsal view. Female *L. versatum* have T1 acarinarial fan with wide dorsal opening.

Male *L. smilacinae* are similar to females and may be further distinguished by head longer (length/width ratio = 0.95–0.99), mesepisternal punctures distinct, mesoscutum relatively polished, dorsolateral angle of pronotum obtuse, and apical impressed margins of metasomal terga with widely scattered punctures. They are most similar to *L. gotham*, *L. obscurum* and *L. wheeleri*. Male *L. gotham* have a narrow band of relatively dense punctation on base of apical impressed areas of metasomal terga. Male *L. obscurum* have head longer (length/width ratio = 1.02–1.05) and apical impressed areas of metasomal terga impunctate. Male *L. wheeleri* have dorsolateral angle of pronotum acute and apical impressed areas of metasomal terga impunctate.

Range. Southern Ontario, south to Maryland and west to Colorado. **USA**: CO, CT, GA, IA, IL, KS, MA, MD, ME, MI, MO, NC, NJ, NY, PA, SC, VA, WI, WV. **CANADA**: ON, PQ.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Lasioglossum smilacinae was previously considered a junior synonym of *L. laevissimum*. The lectotype was examined in 2007 and it was thought that the synonymy, first made by Mitchell (1960), was valid. Subsequently, *L. zophops* was reported to occur in eastern North America (Gibbs 2010b). The lectotype was re-examined in 2011 and it is now evident that the synonymy was incorrect and *L. smilacinae* is the valid name for the species previously reported as *L. zophops*. The new synonymy with *D. philanthanus* was made possible by comparative study to male *L. smilacinae* and the related species *L. gotham*.

Lasioglossum (*Dialictus*) *stuartense* (Mitchell)

(Figures 197, 198)

Dialictus stuartensis Mitchell, 1960: 419. ♀.

Holotype. ♀ USA, Florida, Stuart, 18.ix.1927 [NCSU]

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *stuartense*, p. 466 (catalogue); Moure and Hurd, 1987: *Dialictus stuartensis*, p. 131 (catalogue).

Diagnosis. The holotype of *L. stuartense* can be recognized by the following combination: size small; head round (length/width ratio = 0.98); mesoscutum imbricate-tessellate, punctures dense except medially (i=0.5–1.5d); tegula very pale yellow; mesepisternum rugulose; metapostnotal rugae reaching two-thirds distance to posterior margin; T1 acarinarial fan with dorsal opening; and metasomal terga with sparse tomentum.

FIGURE 197. *Lasioglossum stuartense* (Mitchell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Male unknown.

Redescription. FEMALE. Length 3.15 mm; head length 1.07 mm; head width 1.09 mm; forewing length 2.60 mm.

Colouration. (See comments below). Head and mesosoma weakly bluish. Clypeus with apical half reddish brown. Antenna brown, flagellum with ventral surface reddish brown. Tegula pale yellow. Wings subhyaline, venation and pterostigma brownish yellow. Legs brown, except tarsi brownish yellow. Metasomal terga and sterna brownish orange, apical margins translucent brownish yellow.

Pubescence. Dull white. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena with subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately dense, fine hairs. T1 acarinarial fan with dorsal opening. T2–T3 lateral portions and T4 with sparse tomentum. T2 apicolateral and T3–T4 apical margins with sparse fringes.

Surface sculpture. Face imbricate, punctation fine. Clypeus punctation dense (i=1–2d). Supraclypeal area with punctation moderately dense (i=1–1.5d). Lower paraocular and antennocular areas with punctation dense (i≤d). Upper paraocular area, frons and ocellocular area punctate-reticulate. Gena and postgena lineolate. Mesoscutum imbricate-tessellate, punctation fine, dense on between parapsidal lines (i=0.5–1.5d), contiguous laterad of parapsidal line and on anterolateral portion. Mesoscutellum weakly imbricate-tessellate, submedial punctation moderately dense (i=1–1.5d). Axilla punctate. Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area and mesepisternum rugulose, imbricate posteriorly. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum with weak rugae reaching 2/3 distance to posterior margin, posterior margin imbricate. Propodeum with dorsolateral slope and lateral surface imbricate, posterior surface tessellate. Metasomal terga polished except dorsal portion of declivitous surface coriarious, punctation relatively sparse throughout (i=1–2.5d).

Structure. Head moderately elongate (length/width ratio = 0.98). Eyes convergent below (UOD/LOD ratio = 1.32). Clypeus ½ below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 2 branches. Metapostnotum truncate (MMR ratio = 1.43), posterior margin rounded onto posterior surface. Propodeum with oblique carina virtually absent, lateral carina weak, reaching halfway to dorsal margin.

MALE. Unknown,

Range. Florida, topotypical (Fig. 199).

Floral records. ASTERACEAE: *Chrysopsis*.

Comments. Only known from the holotype. The holotype appears to be somewhat bleached and the colouration listed above may not be reliable.

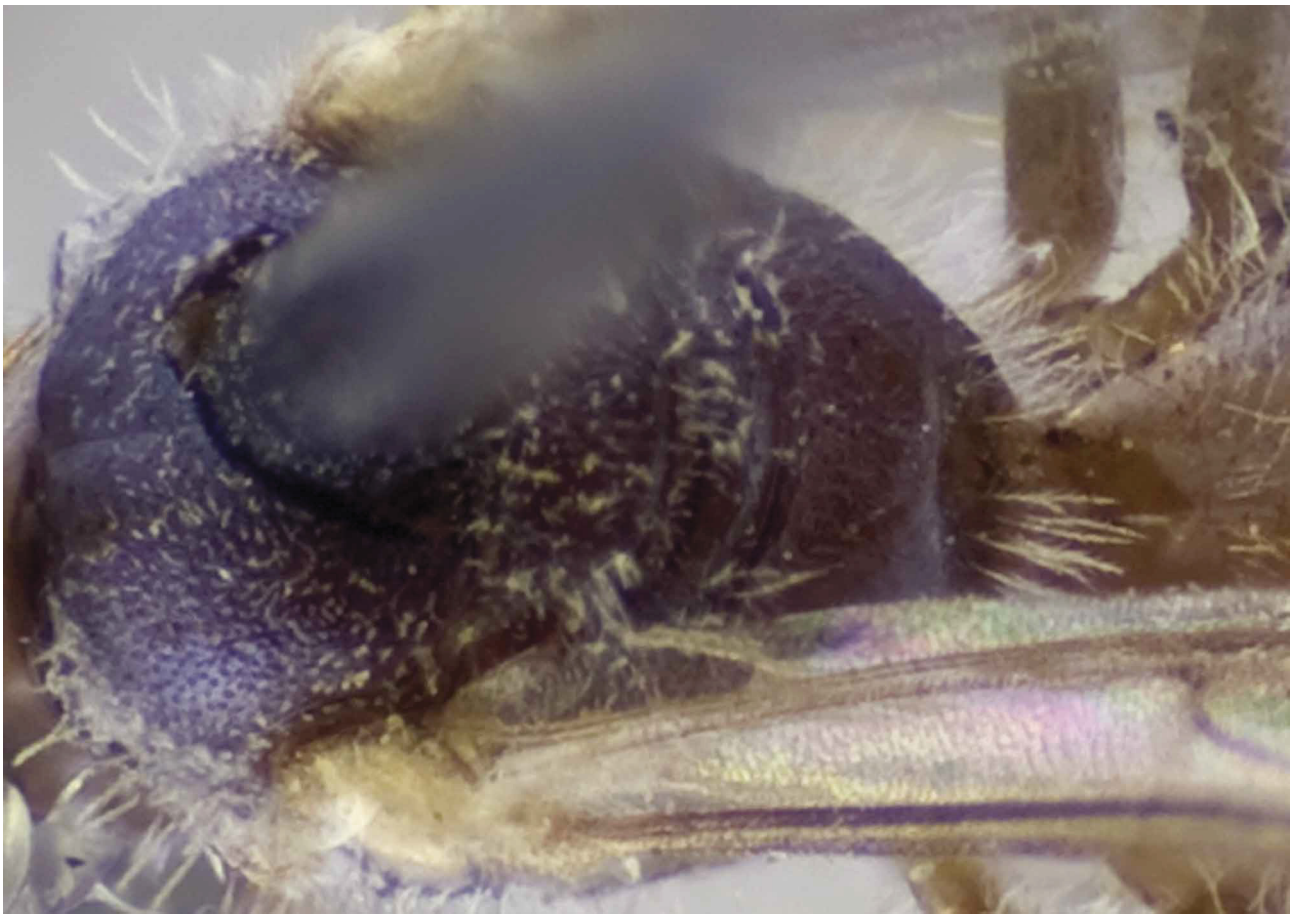

FIGURE 198. *Lasioglossum stuartense* (Mitchell) female, dorsal view of mesosoma.

FIGURE 199. Distribution map of *Lasioglossum stuartense* (square), *L. surianae* (stars) and *L. tamiamense* (circles).

Lasioglossum (*Dialictus*) *subversans* (Mitchell)

Dialictus subversans Mitchell, 1960: 419. ♀.

Holotype. ♀ USA, Michigan, Otsego Co., 26.iv.1944 (R.R. Dreisbach); [NCSU]. Examined.

Dialictus perpunctatulus Knerer and Atwood, 1966a: 884. ♀♂.

Holotype. ♀ CANADA, Ontario, Arctic Watershed, Timiskaming District, 21.vi.1961 on *Fragaria*, (G. Knerer); [ROM: 83912]. Examined.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *subversans*, p. 466 (catalogue); *Dialictus perpunctatulus*, p. 1970, *D. subversans*, p. 1972 (catalogue); Moure & Hurd, 1987: *Dialictus perpunctatulus*, p. 121, *D. subversans*, p. 132 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *subversans* ♀♂, p. 309 (redescription, key, synonymy).

Diagnosis. Female *L. subversans* can be recognised by the following diagnostic combination: head wide (length/width ratio = 0.94–0.97); supraclypeal area strongly brassy; mesoscutum imbricate, punctures moderately dense between parapsidal lines (i=1–1.5d); mesepisternal punctures distinct but irregular; metapostnotum with weak longitudinal rugae, not reaching rounded posterior margin; and metasomal terga brown, with sparse tomentum, apical punctation very obscure. They are most similar to *L. foveolatum*, which has a strongly convex supraclypeal area and wide parapsidal lines.

Male *L. subversans* can be distinguished from all other eastern USA *L.* (*Dialictus*) by the very long and dense scopa-like hairs on S2–S3 and apicolateral portions of S4–S5 (Fig. 35A).

Range. Nova Scotia west to British Columbia. **USA**: ME, MI. **CANADA**: AB, BC, NB, NS, ON, PE, PQ, SK.

DNA Barcode. Available. Multiple sequences.

Comments. Rare. *Lasioglossum subversans* seems to have a boreal distribution.

Lasioglossum (*Dialictus*) *subviridatum* (Cockerell)

Halictus (*Chloralictus*) *subviridatus* Cockerell, 1938a: 2. ♀♂.

Holotype. ♀ CANADA, Saskatchewan, Lake Ajawaan, 26.viii.1936, (Cockerell); [AMNH]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *subviridatum*, p. 1118 (catalogue); *Dialictus subviridatus*, p. 1972 (catalogue); Moure & Hurd, 1987: *Dialictus subviridatus*, p. 132 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *subviridatum* ♀♂, p. 313 (redescription, key).

Diagnosis. Female *L. subviridatum* can be recognised by the following diagnostic combination: head wide (length/width ratio = 0.93–0.96); mesoscutum polished due to weak microsculpture, punctures moderately sparse between parapsidal lines (i=1–2.5d); tegula brownish yellow; mesepisternum weakly rugulose, relatively shiny; metapostnotum strongly rugoso-carinulate; T1 polished due to lack of microsculpture; T1 acarinarial fan small with very wide dorsal opening; metasomal terga brown, apical halves sparsely punctate; and T2–T3 basolaterally and T4 entirely with very sparse tomentum and weak apical fringes. They are most similar to *L. abanci*, which has very sparse basomedial punctation on T2. They are also similar to *L. planatum* and *L. oblongum*, both of which have the mesoscutum and mesepisternum dull due to microsculpture.

Male *L. subviridatum* can be recognised by the following combination: head moderately long (length/width ratio = 1.02); facial tomentum limited to lower paraocular area; flagellomeres long (length/width ratio = 1.80–1.93), bright orange-yellow ventrally; mesoscutum imbricate, punctures sparse between parapsidal lines (i=1–2.5d); mesepisternum rugulose; metapostnotum with coarse rugae reaching posterior margin; propodeum dorsolateral slope rugose; metasomal terga polished, apical halves impunctate (except along premarginal line); and S3–S5 with sparse apicolateral patches of plumose hairs (Fig. 32B). They are most similar to *L. laevissimum*, *L. oblongum* and *L. ephialtum*. Male *L. laevissimum* have denser hairs on metasomal sterna, particularly on S3 (Fig. 32A). Male *L. oblongum* have very coarse rugae on metapostnotum separated by smooth, shining areas distinctly wider than rugae. Male *L. ephialtum* have sparse basolateral tomentum on metasomal terga.

Range. Saskatchewan east to Ontario, New Hampshire, south to Virginia. **USA**: CT, IL, IN, MA, MD, NH, NJ, NY, WI, WV, VA. **CANADA**: ON, SK.

DNA Barcode. Available. Multiple sequences.

Comments. Common. Until recently this species was only known from the type locality (see Wolf & Ascher 2009; Gibbs 2010b). Additional sampling in areas near the type locality are needed to test the limits of the species and to ensure eastern USA material is conspecific. DNA barcodes suggest that there may be a second, closely related species but morphological study has not yet been able to find corroborating characters.

Specimens of *L. subviridatum* at CUIC were collected from nests in logs.

Lasioglossum (*Dialictus*) *succinipenne* (Ellis)

Halictus succinipennis Ellis, 1913: 205. ♀.

Holotype. ♀ USA, Colorado, Florissant, 14.vi.1948 on sand (S.A. Rohwer); [NMNH: 28200]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *succinipenne*, p. 1118 (catalogue); Hurd, 1979: *Dialictus succinipennis*, p. 1972 (catalogue); *Dialictus succinipennis*, p. 1972 (catalogue); Moure & Hurd, 1987: *Dialictus succinipennis*, p. 132 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *succinipenne* ♀♂, p. 317 (redescription, key).

Diagnosis. Female *L. succinipenne* can be recognised by the following diagnostic combination: head long (length/width ratio = 1.05–1.09), clypeus apicolateral margins weakly convergent, supraclypeal area elongate, mesoscutal punctures dense throughout (i<d), metapostnotum rugoso-carinulate, and metasomal terga metallic, with dense, whitish tomentum. They are most similar to *L. pilosum* and *L. leucocomum*. Female *L. pilosum* have subparallel apicolateral margins of clypeus and distinctly yellowish pubescence. Female *L. leucocomum* have a shorter supraclypeal area.

Male *L. succinipenne* can be recognised by the following combination: head long (length/width ratio = 1.09–1.21), eyes strongly convergent below (UOD/LOD ratio = 1.38–1.48), clypeus yellow distally, mesoscutal punctures dense, mesepisternum with obscure punctures, metapostnotum rugoso-carinulate, metasomal terga metallic with dense and distinct punctures. They are most similar to *L. pilosum*, which lacks mesepisternal punctures.

Range. Alberta and Manitoba south to Colorado, west to Illinois and southern Ontario. **USA**: CO, IL, MN, NE, WI. **CANADA**: AB, MB, ON.

DNA Barcode. Available. Multiple sequences.

Comments. Common in Midwest. Until recently, *L. succinipenne* was only known from Colorado. It was later identified from Manitoba (Patenaude 2007) and subsequently from numerous Midwestern sites (Wolf & Ascher 2009; Gibbs 2010b).

Lasioglossum (*Dialictus*) *surianae* (Mitchell)

(Figures 200–203)

Dialictus surianae Mitchell, 1960: 420. ♀.

Holotype. ♀ USA, Florida, Plantation Key, 27.xi.1955 (H.V. Weems, Jr.); [FCSA]

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *surianae*, p. 466 (catalogue); Moure and Hurd, 1987: *Dialictus surianae*, p. 132 (catalogue).

Diagnosis. Both sexes of *L. surianae* can be recognised by the following diagnostic combination: tegula enlarged, pale yellow, with posterior angle (Figs. 201, 203), and fine punctation. Female *L. surianae* have metasomal terga reddish orange (Fig. 200A).

Redescription. FEMALE. Length 4.31–4.42 mm; head length 1.22–1.33 mm; head width 1.27–1.36 mm; forewing length 2.94–2.96 mm.

Colouration. Head and mesosoma pale golden green. Labrum and lower paraocular area orange. Mandible brownish yellow. Clypeus with apical half orange to reddish. Antenna brown, flagellum with ventral surface brownish orange. Tegula orange. Wing faintly dusky, venation and pterostigma reddish brown. Legs brown, except tarsi brownish yellow. Metasoma brownish red, terga and sterna with apical margins brownish yellow.

Pubescence. Dull white. Moderately dense. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Gena with sparse subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (1.5–2 OD). Metasomal terga with sparse, fine hairs. T1 acarinarial fan complete. T2–T4 basolaterally with very sparse tomentum. T2 apicolateral and T3–T4 apical margins with very sparse fringes, virtually absent.

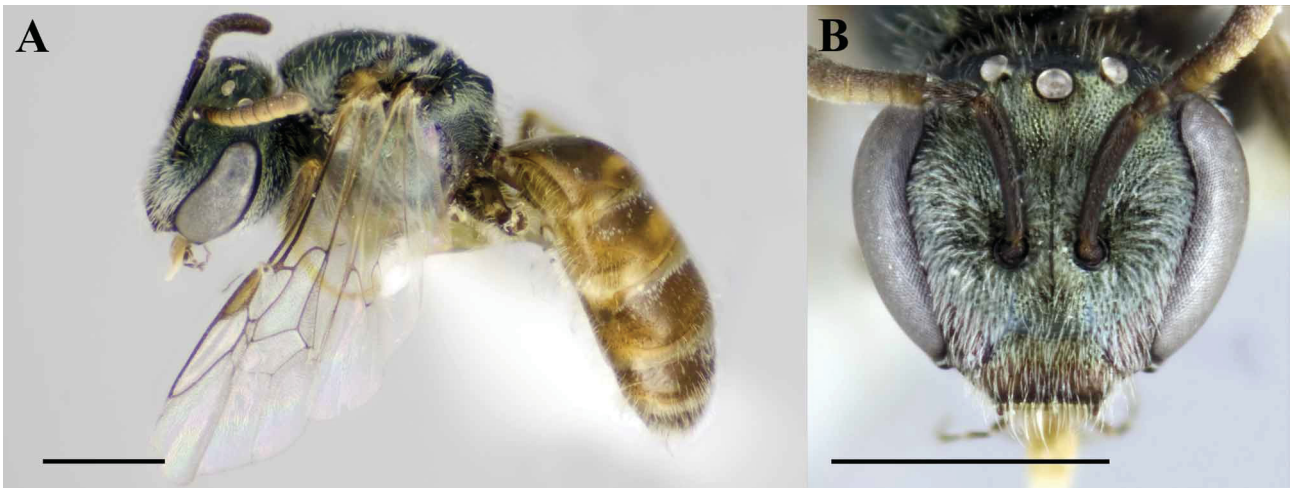

FIGURE 200. *Lasioglossum surianae* (Mitchell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 201. *Lasioglossum surianae* (Mitchell) female, dorsal view of mesosoma.

Surface sculpture. Face imbricate, punctation moderately strong. Clypeus polished, basal margin imbricate, punctation moderately dense (i=1–1.5d). Supraclypeal area with punctation moderately sparse (i=1–3d). Lower paraocular area punctation dense (i≤d). Antennocular area punctation moderately dense (i≤1.5d). Upper paraocular, frons and ocellocular area reticulate-punctate. Gena and postgena lineolate. Mesoscutum tessellate, punctation fine, moderately dense on central disc (i=1–2d), dense laterad of parapsidal line and on anterolateral portion (i≤d). Mesoscutellum similar to mesoscutum, submedial punctation moderately dense (i=1–1.5d). Axilla punctate. Metanotum imbricate. Preëpisternum, hypoepimeral area, and mesepisternum reticulate-rugulose. Metapostnotum with anastomosing rugae. Propodeum with

dorsolateral slope striate, lateral and posterior surface imbricate-tessellate. Metasomal terga weakly polished except T1 declivitous surface coriarious, punctation very fine, on basal halves moderately dense (i=1.5d), sparser on apical halves (i=1–2d).

Structure. Head moderately wide (length/width ratio = 0.96–0.97). Eyes convergent below (UOD/LOD ratio = 1.26–1.27). Clypeus ½ below suborbital tangent, apicolateral margins convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2 OD below median ocellus. Gena narrower than eye. Tegula elongate, angulate posteromedially. Inner metatibial spur pectinate with 2–3 branches. Metapostnotum relatively elongate (MMR ratio = 1.15), posterior margin weakly angled onto posterior surface. Propodeum with oblique carina weak, lateral carina weak, not reaching dorsal margin.

MALE (metasoma not examined). Similar to female except for the usual secondary sexual characters and as follows. Head length 1.28 mm; head width 1.28 mm; forewing length 2.94 mm.

Colouration. Mandible, flagellum ventral surface, tegula, tarsi brownish yellow.

Pubescence. Lower paraocular area tomentum obscuring surface.

Surface sculpture. Clypeus densely punctate (i=d). Mesepisternum polished, punctate (i=d). Propodeum posterior surface punctate.

Structure. Head elongate (length/width ratio = 1.00). Eyes strongly convergent below (UOD/LOD ratio = 1.52). Clypeus 2/3 below suborbital tangent, apicolateral margins subparallel. Antennal sockets distant (IAD/OAD > 0.7). Frontal line carinate, ending 2 OD below median ocellus. Pedicel shorter than F1. F2 length 1.6X F1. F2–F10 moderately elongate (length/width ratio = 1.30–1.45). Metapostnotum elongate (MMR ratio = 1.28), posterior margin rounded onto posterior surface.

Terminalia. Not examined.

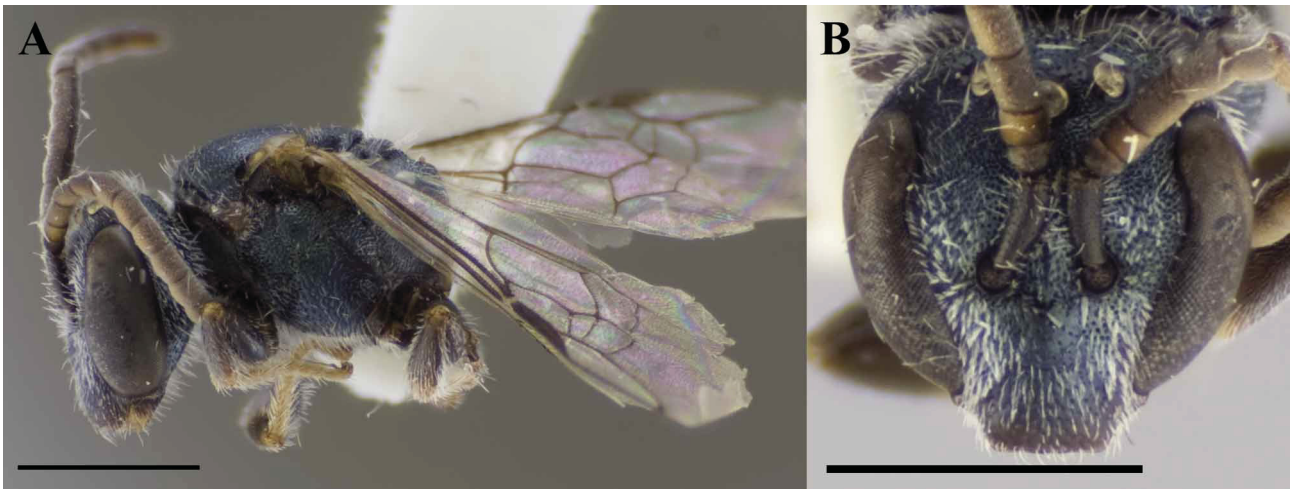

FIGURE 202. *Lasioglossum surianae* (Mitchell) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Range. Southern Florida, Bahamas (Fig. 199).

Additional material examined. BAHAMAS: 2♀♀ Great Exuma, Georgetown N., Isl. #26, N23.5 W75.75, 8.viii.2004 (M.F. Keller); [PCYU]; 1♂ Gorda Cay, N26°05′ W77°32′, 26.vi–7.vii.1998 (T. Peak); 1♀ Gorda Cay, N26°05′ W77°32′, 7–16.vii.1998 (T. Peak); [UCFC]. **USA:** FLORIDA: 1♀ *paratype* Key Vaca, 28.xii.1955 (H.V. Weems, Jr.); 1♀ Monroe Co., Stock Island, 15.x.1963 (H.V. Weems, Jr.); Monroe Co., Big Pine Key, 23.vi.1971 (W.H. Pierce); 1♂ Monroe Co., Big Pine Key, 19.v.1971 (W.H. Pierce); [CUIC].

Floral records. ASTERACEAE: *Bidens pilosa*; CONVOLVULACEAE: *Jacquemontia* SURIANACEAE: *Suriana maritima*.

DNA Barcode. Available. Single sequence.

Comments. Rare.

Lasioglossum surianae belongs to the *L. tegulare* species group (equivalent to the *L. parvum* group of Eickwort (1988)). It is similar to the West Indian species *L. gemmatum* (Smith).

FIGURE 203. *Lasioglossum surianae* (Mitchell) male, dorsal view of mesosoma.

Lasioglossum (*Dialictus*) *tamiamense* (Mitchell)

(Figures 204–206)

Dialictus tamiamensis Mitchell, 1960: 421. ♀♂.

Holotype. ♀ USA, Florida, Olga, 29.iii.1954, on sand flats (K.V. Krombein); [NMNH: 66070]. Examined.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *tamiamense*, p. 466 (catalogue); Moure and Hurd, 1987: *Dialictus tamiamensis*, p. 133 (catalogue).

Diagnosis. Female *L. tamiamense* can be recognised by the following diagnostic combination: head long (length/width ratio = 1.08–1.09) (Fig. 204B); mesoscutal punctures dense, except along medial line (Fig. 205); metapostnotal rugae very fine, obscure among tessellate background (Fig. 205); T1 acarinarial fan large, complete (Fig. 205), intermixed with erect hairs dorsally; and T2 apical impressed area with distinct but fine punctation. They are most similar to *L. halophitum* and *L. creberrimum*. Female *L. halophitum* have mesoscutal punctures sparse over most of disc only becoming dense adjacent to the parapsidal lines (Fig. 122). Female *L. creberrimum* have T1 acarinarial fan smaller without intermixed erect hairs dorsally, and T2 apical impressed area with very obscure punctation.

Male *L. tamiamense* can be recognised by the following diagnostic combination: head long (length/width ratio = 1.07) (Fig. 206B), clypeus with distal margin brownish yellow (Fig. 206B), mesoscutal punctures contiguous (i<d), T1–T2 apical impressed areas impunctate, and S5 apical margin deeply concave with dense apicolateral hairs. They are most similar to male *L. creberrimum*, which have T1–T2 at most narrowly impunctate at apical margin and S5 apical margin weakly concave with sparse apicolateral hairs.

Redescription. FEMALE. Length 4.60–5.02 mm; head length 1.52–1.54 mm; head width 1.40–1.42 mm; forewing length 3.39–3.45 mm.

FIGURE 204. *Lasioglossum tamiamense* (Mitchell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 205. *Lasioglossum tamiamense* (Mitchell) female, dorsal view of mesosoma.

Colouration. Head and mesosoma blue with greenish reflections. Clypeus with apical half blackish brown. Supraclypeal area bronze. Antenna dark brown, flagellum with ventral surface reddish brown. Tegula brownish yellow. Wings faintly dusky, venation and pterostigma brownish yellow. Legs brown, except medio- and distitarsi reddish brown. Metasomal terga and sterna brown, apical margins translucent brownish yellow.

Pubescence. Dull white. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena without subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately

dense, fine hairs. T1 acarinarial fan complete. T2–T5 lateral portions with sparse tomentum. T2 apicolateral and T3–T4 apical margins with sparse fringes.

Surface sculpture. Face imbricate, punctation fine. Clypeus punctation dense (i≤d). Supraclypeal area with punctation moderately dense (i≤d). Lower paraocular and antennocular areas with punctation dense (i≤d). Upper paraocular area, frons and ocellocular area punctate-reticulate. Gena and postgena lineolate. Mesoscutum tessellate, punctation fine, dense on medial portion of disc (i=1–1.5d), punctate-reticulate mesad and laterad of parapsidal line and on anterolateral portion. Mesoscutellum weakly imbricate-tessellate, submedial punctation moderately dense (i<d). Axilla punctate. Metanotum imbricate. Preëpisternum rugose. Hypoepimeral area imbricate. Mesepisternum rugose, rugulose posteriorly. Metepisternum with dorsal half rugoso-carinulate, ventral half imbricate. Metapostnotum with very weak rugae, posterior margin tessellate-granular. Propodeum with dorsolateral slope carinulate, lateral surface imbricate-tessellate, posterior surface tessellate. Metasomal terga polished, punctation moderately dense throughout (i=1–1.5d), sparser on apical impressed areas (i=1–2.5d).

Structure. Head elongate (length/width ratio = 1.08–1.09). Eyes convergent below (UOD/LOD ratio = 1.23–1.26). Clypeus ½ below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending 2.5 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3–4 branches. Metapostnotum truncate (MMR ratio = 1.30–1.35), posterior margin narrowly rounded onto posterior surface. Propodeum with oblique carina fine, lateral carina weak, reaching halfway to dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 3.81 mm; head length 1.39 mm; head width 1.30 mm; forewing length 2.96 mm.

Colouration. Labrum, mandible and distal margin of clypeus yellow. Flagellum with ventral surface brownish yellow. Legs brown, except tibial bases and apices and tarsi brownish yellow.

Pubescence. Paraocular area below eye emargination with tomentum obscuring surface. Clypeus largely obscured by tomentum. S2–S3 with posteriorly directed hairs (1–1.5 OD), S4–S5 apical margins with dense hairs.

Surface sculpture. Mesoscutellar punctation dense (i<d). Metasomal terga with apical impressed areas impunctate.

Structure. Head elongate (length/width ratio = 1.07). Eyes strongly convergent below (UOD/LOD ratio = 1.38). Clypeus 2/3 below suborbital tangent, apicolateral margins subparallel. Antennal sockets distant (IAD/OAD > 0.7). Frontal line carinate, ending 2 OD below median ocellus. Pedicel shorter than F1. F2 length 1.8X F1. F2–F10 moderately elongate (length/width ratio = 1.50–1.60). Metapostnotum elongate (MMR ratio = 1.28), posterior margin rounded onto posterior surface. S5 deeply concave.

Terminalia. S7 with median lobe acuminate. S8 with apicomedial margin weakly convex. Gonobase with ventral arms separated. Volsella roughly ovoid. Gonostylus long, dorsal setae elongate. Retrorse lobe elongate, attenuated apically.

FIGURE 206. *Lasioglossum tamiamense* (Mitchell) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Range. Florida (Fig. 199).

Additional material examined. USA: FLORIDA: 1♀ Highlands Co., Archbold Biological Station, N27.18833 W081.33778, 18.iii.2002 (J.S. Ascher); 1♂ Putnam Co., Crescent City, N29.43 W081.5108, 20.iv.1908 (Van Duzee); [AMNH];; 1♀ *paratype* Punta Gorda, 11.iv.1962 (J.R. Vockeroth); [CNC]; 2♀♀ *paratypes* East end Tamiami Trail, 22.vi.1949 (T.B. Mitchell); 6♀♀ *paratype* Marion Co., 8.iv.1956 (R.A. Morse); 1♂ Punta Gorda, 17.xi.1911; 1♀ Highlands Co., Archbold Bio. Res. Stn., 14.iv.1963 (J.G. & B.L. Rozen); 1♂ Highlands Co., Highland Hammock S.P., 13.iv.1974 (G.C. Eickwort); 1♀ Alachua Co., 13.ii.1930 (C.J. Guard); 1♂ Columbia Co., 22.i.1930 (R.B. Howard); 1♀ Orange Co., 7–15.ii.1930 (W.M. Loe)); 1♀ Volusia Co., 29.i.1930 (W.A. Hiers); 1♀ Union, Walton Co., 23.xii.1929 (R.B. Howard); [CUIC]; 1♀ (*Halictus ashmeadi* paratype) Inverness (C. Robertson); [INHS]; 4♀♀ *paratypes* East end Tamiami Trail, 22.vi.1949 (T.B. Mitchell); 4♀♀ *paratypes* Marion Co., 6.iv.1956 (R.A. Morse); 2♀♀ *paratypes* Marion Co., 17.iv.1956 (R.A. Morse); 1♀ *paratype* Olga, 29.iii.1954 (K.V. Krombein); 1♂ *paratype* Olga, 30.iii.1954 (K.V. Krombein); 2♀♀ *paratypes* Volusia Co., 10.viii.1936 (H.A. Denmark); [NCSU]; 1♂ *paratype* Olga, on sand flats, 30.iii.1954 (K.V. Krombein); [NMNH].

Floral records. ASTERACEAE: *Bidens pilosa*, *Erigeron quercifolius*; FABACEAE: *Chamaecrista fasciculata*, *Medicago "lupina"*, *Melilotus officinalis*, *Trifolium repens*; HYDROPHYLLACEAE: *Hydrolea ovata*; LAMIACEAE: *Stachys floridana*.

DNA Barcode. Available. Single sequence.

Comments. Uncommon.

Several paratypes of *L. tamiamense* are in fact *L. creberrimum* (one paratype from Alachua county is a *L. puteulanum*).

Lasioglossum (*Dialictus*) *tarponense* (Mitchell)

(Figures 207–211)

Dialictus tarponensis Mitchell, 1960: 423. ♀.

Holotype. ♀ USA, Florida, Tarpon Springs, 21.iii.1950 (H.K. Townes); [NCSU]. Examined.

Dialictus placidensis Mitchell, 1960: 441. ♂.

Holotype. ♂ USA, Florida, Lake Placid, 27.xii.1956 (K.V. Krombein); [NCSU]. Examined.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *placidense*, p. 466, *L.* (*D.*) *tarponense*, p. 466 (catalogue); Moure and Hurd, 1987: *Dialictus placidensis*, p. 124, *D. tarponensis*, p. 133 (catalogue).

Diagnosis. Both sexes of *L. tarponense* can be recognised by the following diagnostic combination: legs nearly entirely yellowish orange (Fig. 209), clypeus yellowish orange (Figs. 207B, 209B), and mesepisternum punctate.

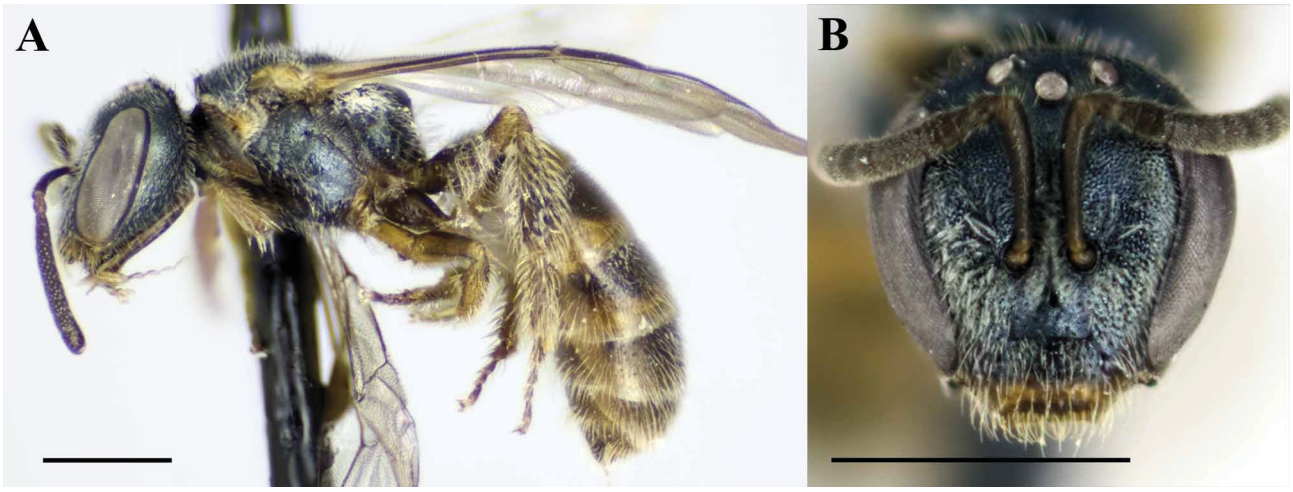

FIGURE 207. *Lasioglossum tarponense* (Mitchell) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Redescription. FEMALE. Length 4.41 mm; head length 1.32 mm; head width 1.27 mm; forewing length 3.45 mm.

Colouration. Head and mesosoma pale green to pale blue. Labrum and mandible yellowish orange. Clypeus with apical half yellowish orange. Antenna dark brown, flagellum with ventral surface reddish brown. Pronotal lobe brownish yellow. Tegula amber. Wing membrane subhyaline, venation and pterostigma brown. Legs yellowish orange. Metasoma reddish brown, terga and sterna with apical margins translucent brownish yellow.

Pubescence. Dull white. Moderately sparse. Head and mesosoma with moderately sparse woolly hairs (1–2 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Paraocular area and gena with moderately dense subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately sparse, fine hairs. T1 acarinarial fan complete, without dorsal opening. T2–T3 with basolateral tomentum. T4 with scattered tomentum. T2 apicolateral and T3–T4 apical margins with sparse fringes.

Surface sculpture. Face imbricate, punctation fine. Clypeus with apical half polished, punctation moderately sparse (i=1–2d). Supraclypeal area with punctation moderately sparse (i=1–2.5d), denser laterally. Lower paraocular area punctation dense (i≤d). Antennocular area punctation moderately dense (i=1–1.5d). Upper paraocular area and frons very finely punctate. Ocellocular area punctate (i≤d). Gena and postgena lineolate. Mesoscutum weakly tessellate-imbricate, polished submedially, punctation sparse between parapsidal lines (i=1–2.5d), denser laterad of parapsidal line (i=1–1.5d), and on anterolateral portion (i≤d). Mesoscutellum similar to mesoscutum, submedial punctation sparse (i=1.5–5d). Axilla minutely punctate. Metanotum imbricate-punctate. Preëpisternum imbricate-rugulose. Hypoepimeral area imbricate-punctate (i=1–1.5d). Mesepisternum distinctly punctate (i=1–2d), interspaces tessellate dorsally, weakly imbricate to polished ventrally. Metepisternum with dorsal half rugoso-carinulate, ventral portion imbricate. Metapostnotum with short rugae extending approximately 2/3 distance to posterior margin, posterior margin weakly imbricate. Propodeum with dorsolateral slope imbricate, lateral and posterior surfaces tessellate. Metasomal terga weakly coriarious, punctation moderately dense basally (i=1-1.5d), T2 apical impressed area similarly punctate (i=1–2.5d) but extremely obscure.

FIGURE 208. *Lasioglossum tarponense* (Mitchell) female, dorsal view of mesosoma.

Structure. Head moderately elongate (length/width ratio = 1.04). Eyes convergent below (UOD/LOD ratio = 1.23). Clypeus 1/2–2/3 below suborbital tangent, apicolateral angle convergent. Antennal sockets close (IAD/OAD < 0.5).

Frontal line carinate, ending 2–2.5 OD below median ocellus. Gena narrower than eye. Inner metatibial spur pectinate with 3 branches. Metapostnotum moderately elongate (MMR ratio = 1.30), posterior margin rounded onto posterior surface. Propodeum with oblique carina absent, lateral carina not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 4.17 mm; head length 1.31 mm; head width 1.19 mm; forewing length 3.39 mm.

FIGURE 209. *Lasioglossum tarponense* (Mitchell) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 210. *Lasioglossum tarponense* (Mitchell) male, dorsal view of mesosoma.

Colouration. Flagellum with ventral surface brown.

Pubescence. Paraocular area with moderately dense tomentum. S2–S4 apical halves with moderately dense hairs (1.5 OD).

Surface sculpture. Punctation coarser. Mesoscutum polished, weakly imbricate medially. Mesepisternum polished, punctate. Metapostnotal rugae nearly reaching posterior margin. Metasomal terga with apical impressed areas impunctate.

Structure. Head elongate (length/width ratio = 1.10). Eyes strongly convergent below (UOD/LOD ratio = 1.55). Clypeus 2/3 below suborbital tangent, apicolateral margins convergent. Antennal sockets distant (IAD/OAD > 0.9). Frontal line carinate, ending 2 OD below median ocellus. Pedicel subequal to F1. F2 length 1.6X F1. F2–F10 moderately elongate (length/width ratio = 1.56–1.70). Metapostnotum elongate (MMR ratio = 1.16), posterior margin rounded onto posterior surface.

Terminalia. S7 with median lobe narrowly clavate, sides subparallel, apex rounded (Fig. 211). S8 with apicomedial margin weakly convex (Fig. 211). Genital capsule as in Fig. 211. Gonobase with ventral arms narrowly separated. Volsella roughly ovoid. Gonostylus small, dorsal setae elongate. Retrorse lobe elongate, attenuated apically.

Range. South-eastern USA (Fig. 212). **USA**: FL, GA, NC, TX.

Additional material examined. USA: FLORIDA: 1♀ Leon Co., Apalachicola National Forest, "ant heaven", N30.31687 W084.50008, 20–27.vi.2005 (Ronquist Lab); [AMNH]; 11♀♀ 1♂ Alachua Co., Gainesville, 16.ix.1977 (L. Masner); 7♀♀ 2♂♂ Highland Co., Lake Placid, Archbold Biol. Stn., 8–14.ix.1987 (BRC Hym. Team); 4♀♀ Highland Co., Lake Placid, Archbold Biol. Stn., 15–21.ix.1987 (BRC Hym. Team); 5♀♀ 1♂ Highland Co., Lake Placid, Archbold Biol. Stn., 21–27.ix.1987 (BRC Hym. Team); 2♀♀ 2♂♂ Highlands Co., Archbold Biol. Stn., 9–16.vi.1987 (D.B. Wahl); [CNC]; 1♀ *paratype* Alachua Co., 17.ii.1955 (H.V. Weems, Jr.); 1♀ *paratype* Alachua Co., 16.iii.1955 (H.V. Weems, Jr.); 1♂ (*D. placidensis* paratype) Manatee Co., Oneco, 25.iii.1954 (G.E. Ball); [CUIC]; 1♀ Highland Co., N27.43 W081.3911, 3.vi.2007 (S.W. Droege); 1♀1♂ Martin Co., N27.0204 W080.1069, 4.vi.2007 (S.W. Droege); 1♀ Martin Co., N27.0125 W080.1028, 4.vi.2007 (S.W. Droege); [PCYU]; 6♂♂ Brevard Co., Titusville, 31.viii–14.ix.2000 (Z. Prusak, P.J. Russell, S. Fullerton); 1♂ Orange Co., Orlando, 4.vi.1993 (S.M. Fullerton); Orange Co.,Walt Disney World, 14–21.iv.1998 (Z. Prusek, S. Fullerton); [UCFC]; GEORGIA: 1♀ *paratype* Tybee Is., 20.iv.1911; [CUIC]; 1♀1♂ Liberty Co., St. Catherines Isl., south beach area, 22–27.vi.1995 (A. Sharkov); [PCYU]; TEXAS: 1♀ Nacogdoches Co., N31.501 W094.7639, 2–16.vi.2010 (C. Adams).

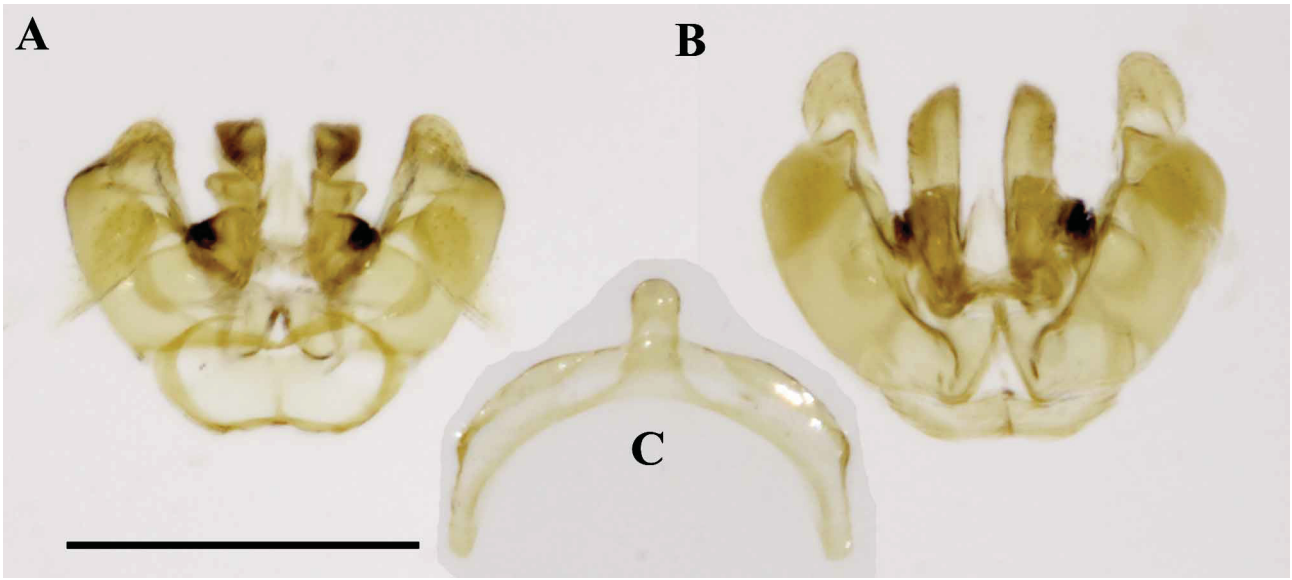

FIGURE 211. *Lasioglossum tarponense* (Mitchell) male terminalia, (A) ventral view, (B) dorsal view, (C) S7 and S8. Scale bar = 0.5 mm.

Floral records. ROSACEAE: *Prunus angustifolia*.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

The synonymy of *L. tarponense* and *D. placidensis* was first recognized by George Eickwort (see Deyrup et al. 2002).

FIGURE 212. Distribution map of *Lasioglossum tarponense* (circles).

Lasioglossum (*Dialictus*) *taylorae* Gibbs

Lasioglossum (*Dialictus*) *taylorae* Gibbs, 2010b: 321. ♀.

Holotype. ♀ CANADA, Ontario, Lambton Co., N43°13.981′ W081°51.90′, 20.vi.2008 (A. Taylor); [PCYU: ANT 5667]

Diagnosis. Female *L. taylorae* can be recognised by the following diagnostic combination: head long (length/width ratio = 1.00–1.07), mesoscutal punctures sparse between parapsidal lines (i=1–2.5d), mesepisternum obscurely punctate, metapostnotal rugae reaching only 2/3–3/4 distance to posterior margin, metasomal terga polished brown, T1 fan with wide dorsal opening, T2–T3 with small basolateral patches of tomentum, and T2 apical impressed area punctate. They are most similar to *L. planatum*, which has T2 apical impressed area impunctate.

Male unknown.

Range. Ontario south to Virginia, west to Wisconsin. **USA**: CT, DC, MA, ME, MI, VA, WI. **CANADA**: ON.

DNA Barcode. Available. Multiple haplotypes.

Comments. Uncommon.

Lasioglossum taylorae belongs to the *L. viridatum* species group.

Lasioglossum (*Dialictus*) *tegulare* (Robertson)

Halictus tegularis Robertson, 1890: 318. ♀♂.

Holotype. ♀ USA, Connecticut, N. Haven, 6 June 1878, (W.H. Patton); [ANSP: 4254] designated herein. Examined.

Taxonomy. Robertson, 1902b: *Chloralictus tegularis*, p. 248 (key); Viereck, 1916: *Halictus* (*Chloralictus*) *tegularis*, p. 706 (key); Michener, 1951: *Lasioglossum* (*Chloralictus*) *tegulare*, p. 1118 (catalogue) Mitchell, 1960: *Dialictus tegularis* ♀♂, p. 423 (redescription, synonymy); Krombein, 1967: *Lasioglossum* (*Dialictus*) *tegulare*, p. 466 (catalogue); *Dialictus tegularis*, p. 1972 (catalogue); Moure & Hurd, 1987: *Dialictus tegularis*, p. 134 (catalogue); Gibbs, 2009a: *Lasioglossum* (*Dialictus*) *tegulare* ♀♂, p. 13 (redescription, tax. status); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *tegulare* ♀♂, p. 323 (redescription, key).

Diagnosis. Female *L. tegulare* can be recognised by the following diagnostic combination: tegula enlarged, strongly punctate with distinct posterior angle (Fig. 7A); head relatively wide (length/width ratio = 0.94–0.97); head and mesosoma greenish; mesepisternum with strong microsculpture between punctures; and inner metatibial spur with 3–4 branches (excluding apex of rachis).

Male *L. tegulare* also have an enlarged tegula and can be distinguished from similar species by dense punctures on T2 immediately basal of premarginal line (Fig. 38A) and sparse facial tomentum, except on lower paraocular area. They are most similar to *L. ellisiae* and *L. puteulanum*. Male *L. ellisiae* have sparse punctures on T2 immediately basal of premarginal line (Fig. 38B). Male *L. puteulanum* have more tomentum distributed outside of lower paraocular area.

Range. Ontario south to Georgia. **USA**: CT, DC, GA, KY, MA, MD, MO, NC, NE, NJ, NY, RI, SC, TN, VA, VT, WV. **CANADA**: ON.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

The taxonomic limits of this species were recently revised (Gibbs 2009a). The specimen indicated above is herein designated as the lectotype to ensure stability of the name.

Lasioglossum (*Dialictus*) *tenax* (Sandhouse)

Halictus (*Chloralictus*) *tenax* Sandhouse, 1924: 15. ♀.

Holotype. ♀ USA, Colorado, Long Peak Inn, Colorado, 25.vi., (Cockerell); [NMNH: 26406]. Examined.

Halictus (*Chloralictus*) *meritus* Sandhouse, 1924: 19. ♀.

Holotype. ♀ USA, Colorado, Halfway House, Pikes Peak, 30.v., on *Fragaria*, (Cockerell); [NMNH: 26415]. Examined.

Dialictus disabanci Knerer and Atwood, 1966*a*: 882. ♀♂.

Holotype. ♀ CANADA, Ontario, Pearl, Thunder Bay Dist., 20.viii.1963 on *Anaphalis*, (G. Knerer); [ROM: 83869]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *meritum*, p. 1115, *L.* (*C.*) *tenax*, p. 1118 (catalogue); Hurd, 1979: *Dialictus disbanci* (*lapsus calami*), p. 1966, *D. meritus*, p. 1968, *D. tenax*, p. 1972 (catalogue); Moure & Hurd, 1987: *Dialictus disabanci*, p. 99, *D. meritus*, p. 112, *D. tenax*, p. 134 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *tenax* ♀♂, p. 329 (redescription, key, synonymy).

Diagnosis. Female *L. tenax* can be recognised by the following diagnostic combination: mesepisternal punctures distinct, mesoscutal punctures dense laterad of parapsidal line, head and mesosoma usually bluish, mesoscutal pubescence dull white, T1 acarinarial fan without dorsal opening, and apical impressed areas of metasomal terga impunctate. They are most similar to *L. cattellae*, which has head and mesosoma golden green and mesoscutal pubescence yellowish.

Male *L. tenax* can be recognised by the following diagnostic combination: head wide to round (length/width ratio = 0.96–1.02); mesoscutum dull, punctures relatively coarse, sparse between parapsidal lines (i=1–2d); mesepisternum punctate or rugulose; tegula reddish brown; tarsi brownish yellow; and metasomal terga with basolateral tomentum, impunctate on apical half (except along premarginal line).

Range. Newfoundland west to Alaska, south to Colorado, Utah, and North Carolina along the Appalachian mountains. **USA**: AK, CO, NC, NH, UT, WI, WY. **CANADA**: AB, BC, NB, NF, NT, ON, PQ, SK, YT.

DNA Barcode. Available. Multiple sequences.

Comments. Rare in the eastern USA. *Lasioglossum tenax* has an alpine/boreal distribution.

Lasioglossum tenax is evidently a solitary species (Packer 1994).

FIGURE 213. *Lasioglossum testaceum* (Robertson) female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

Lasioglossum (*Dialictus*) *testaceum* (Robertson)

(Figures 213–217)

Halictus testaceus Robertson, 1897: 323. ♀.

Lectotype. ♀ USA, Illinois, Macoupin Co., Carlinville, 11.iv.1896 (C. Robertson); [INHS: 17843] by W.E. LaBerge (in Webb 1980). Examined.

Halictus (*Chloralictus*) *scrophulariae* Cockerell, 1906: 428. ♀. **[new synonymy]**

Holotype. ♀ USA, Colorado, Florissant, 25.vii., (Cockerell); [NMNH: 27772]. Examined.

Halictus (*Chloralictus*) *occultus* Sandhouse, 1924: 27. ♂. (primary junior homonym of *Halictus occultus* Vachal, 1904)**.**

Holotype. ♂ USA, Colorado, Florissant, 23.vii., on *Potentilla*, (Cockerell); [NMNH: 26424]. Examined.

Lasioglossum (*Chloralictus*) *sandhouseae* Michener, 1951: 1117. (catalogue: new name for *H*.(*C*.) *occultus* Sandhouse) **[new synonymy]**

Taxonomy. Robertson, 1902: *Chloralictus testaceus*, p 249 (key); Michener, 1951: *Lasioglossum* (*Chloralictus*) *scrophulariae*, p. 1117, *L*. (*C*.) *testaceum*, p. 1118 (catalogue); Mitchell, 1960: *Dialictus sandhouseae* ♂, p. 418, *D*. *testaceus* ♀, p. 424 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *sandhouseae*, p. 466 (catalogue); Hurd, 1979: *Dialictus sandhouseae*, p. 1971, *D*. *scrophulariae*, p. 1971, *D*. *testaceus*, p. 1972 (catalogue); Moure & Hurd, 1987: *Dialictus sandhouseae*, p. 129, *D*. *scrophulariae*, p. 129, *D*. *testaceus*, p. 135 (catalogue).

Diagnosis. Female *L*. *testaceum* can be distinguished from all *Lasioglossum* North of Mexico by the following diagnostic combination: head and mesosoma metallic, tegula pale, lateral and posterior propodeal surfaces completely separated by strong lateral carina (Figs. 1, 28B), oblique carina strong, metasoma pale brownish yellow (Fig. 213A), T1 acarinarial fan absent (Fig. 214), and T4 with moderately dense tomentum. *Lasioglossum rufulipes* are similar but can be distinguished by their reddish brown tegula and metasomal terga (Fig. 186A), and T4 with sparse tomentum.

Male *L*. *testaceum* can be distinguished by the following combination: labrum, mandible and distal half of the clypeus (Fig. 215B), most of protibia yellow (Fig. 215A); mesoscutal punctation sparse between parapsidal lines (i=1–2d) (Fig. 216); mesepisternum finely punctate; gonobase ventral rim entire; and retrorse lobe narrow and paralled-sided (Fig. 217A). Male *L*. *rufulipes* lack mesepisternal punctures.

Redescription. FEMALE. Length 4.45–4.88 mm; head length 1.22–1.38 mm; head width 1.34–1.40 mm; forewing length 3.66–3.97 mm.

Colouration. Head and mesosoma bluish green with reflections. Labrum brownish yellow. Mandible yellow, apex red, mandible brown. Clypeus with apical half reddish brown, basal half, and supraclypeal area bronze. Antenna brown, F3–F10 with ventral surface brownish yellow. Pronotal lobe apex brownish yellow. Tegula yellow-translucent. Wing venation and pterostigma pale, brownish yellow. Wing membrane subhyaline. Legs brown, except tibial bases and apices, protibial inner surface and tarsi brownish yellow. Metasoma pale brownish yellow, T1 anterolateral portion brown, T2–T4 with brown lateral spots.

FIGURE 214. *Lasioglossum testaceum* (Robertson) female, dorsal view of mesosoma.

Pubescence. Dull white. Sparse. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Face with sparse subappressed tomentum partially obscuring surface. Gena with sparse tomentum adjacent to eye. Pronotal lobe and dorsolateral angle with dense tomentum. Metepisternum obscured by tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with sparse, fine hairs. T1 acarinarial fan absent, declivitous surface with sparse erect hairs (1 OD). T2–T3 basolateral portion with tomentum. T4 with tomentum across disc, partially obscuring surface. T2 apicolateral and T3–T4 apical margins with sparse apical fringe.

Surface sculpture. Face imbricate, punctation fine, shallow. Clypeus polished, basal margin weakly imbricate, punctation moderately dense (i=1–1.5d). Supraclypeal area with punctation moderately sparse (i=1–2d). Lower paraocular area with punctation dense, obscure (i≤d). Antennocular area with punctation moderately dense (i=1–1.5d). Upper paraocular area and frons punctate-reticulate. Ocellocular area obscurely minutely punctate (i≤d). Gena and postgena lineolate. Mesoscutum weakly imbricate, punctation fine, moderately sparse between parapsidal lines (i=1–2d), dense laterad of parapsidal lines (i≤d), and contiguous on anterolateral portions. Mesoscutellum polished, submedial punctation moderately sparse (i=1–2d). Axilla punctate. Metanotum ruguloso-imbricate. Preëpisternum rugulose. Hypoepimeral area obscurely punctate. Mesepisternum below imbricate. Metepisternum with upper third rugoso-carinulate and lower portion imbricate. Metapostnotum incompletely, anastomosing rugose. Propodeum dorsolateral slope, lateral and posterior surfaces imbricate. Metasomal terga polished, apical impressed areas weakly imbricate, punctation on basal half fine (i=1.5–2d), on apical half obscure, virtually impunctate (except along premarginal line).

Structure. Head wide (length/width ratio = 0.91–0.92). Eyes weakly convergent below (UOD/LOD ratio = 1.15–1.17). Clypeus ½ below suborbital tangent, apicolateral margins strongly convergent. Antennal sockets moderately distant (IAD/OAD > 0.6). Frontal carina ends 2 OD from median ocellus. IOD greater than OOD. Gena narrower than eye. Hypostomal carinae parallel. Pronotum with dorsolateral angle obtuse. Pronotal ridge broadly rounded, interrupted by oblique sulcus. Mesoscutum with anteromedial margin very weakly emarginate. Tegula ovoid. Procoxa and protrochanter

unmodified. Inner metatibial spur pectinate with 4–5 short, narrow branches (not including apex of rachis). Metapostnotum lunate, elongate (MMR = 1.08–1.13), posterior margin narrowly rounded onto posterior surface. Propodeum strongly carinate with dorsolateral slope steeply angled, lateral carina reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length. 4.64–5.25 mm; head length 1.27–1.38 mm; head width 1.30–1.40 mm; forewing length 3.60–3.81 mm.

Colouration. Labrum, mandible, and apical half of clypeus pale yellow. Flagellum with ventral surface orange-yellow. Legs brown, except tibiae and tarsi yellow, anterior and posterior surfaces of tibiae infused with brown. Metasoma reddish brown, apical impressed areas often yellowish brown.

FIGURE 215. *Lasioglossum testaceum* (Robertson) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 216. *Lasioglossum testaceum* (Robertson) male, dorsal view of mesosoma.

Pubescence. Face below eye emargination with dense tomentum, less dense on clypeus. S2–S4 apical halves with sparse, plumose hairs (1–1.5 OD), S4–S5 with simple, posteriorly directed hairs (1.5 OD).

Surface sculpture. Mesoscutellum with submedial punctation sparse (i=2–5d). Propodeum with dorsolateral slope and posterior surface rugose. Metasomal terga punctate (i=2–4d) except apical impressed areas impunctate.

Structure. Head moderately wide (length/width ratio = 0.94–0.98). Eyes convergent below (UOD/LOD ratio = 1.43–1.50). Antennal sockets distant (IAD/OAD > 1.75). Frontal carina ends 1.5OD from median ocellus. Pedicel subequal to F1. F2 length 2.4X F1. F2–F10 elongate (length/width ratio = 1.60–2.18). Metapostnotum elongate (MMR = 1.00–1.08).

Terminalia. S7 with median lobe long, acuminate, apex narrowly rounded (Fig. 217). S8 with apical margin weakly convex (Fig. 217). Genital capsule as in Fig. 217. Gonobase with ventral arms connected. Gonostylus small, covered with fine hairs, dorsal setae elongate. Retrorse lobe narrow, parallel-sided, covered with fine hairs. Penis valve narrow apically.

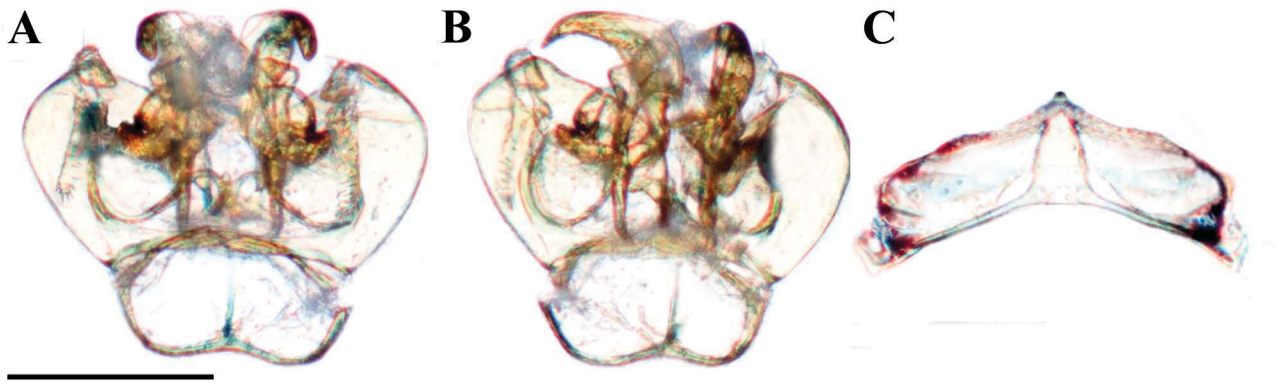

FIGURE 217. *Lasioglossum testaceum* (Robertson) male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

Range. British Columbia south to Colorado, east to Illinois (Fig. 191). Recorded, probably erroneously, from North Carolina and Delaware (Moure & Hurd 1987). **USA:** CO, ID, IL, ND, NM, UT. **CANADA:** AB, BC, SK.

Additional material examined. CANADA: ALBERTA: 1♀ Edmonton, 19.v.1986 (D. Blades); 1♀2♂♂ Red Deer R. At Hwy 876 (W. Of Dinosaur P.P.), 5–6.vii.1989 (J.H. O'Hara); [CNC]; 1♀ Edmonton, 25.v.1986 (D. Blades); 3♀♀ Fort Mcleod, Oldman Riv. Cpgd, 14.vi.1984 (T. Spanton); 1♀1♂ Writing-On-Stone Prov. Park, Birch-North, 18–25.vii.1990 (D. McCorquodale); 1♀ Writing-On-Stone Prov. Park, Grass-North, 26.v–25.vi.1990 (D. McCorquodale); 2♀♀Writing-On-Stone Prov. Park, Sand-North, 18–25.vii.1990 (D. McCorquodale); 2♀♀Writing-On-Stone Prov. Park, Sand-North, 1.viii.1990 (M. Klassen); 1♀ Writing-On-Stone Prov. Park, Sedge-South, 6–12.vi.1990 (D. McCorquodale) 1♀ Writing-On-Stone Prov. Park, Sedge-South, 12–20.vi.1990 (D. McCorquodale) 1♀ Writing-On-Stone Prov. Park, Sedge-South, 30.vi.1990 (M. Klassen); [PMAE]; BRITISH COLUMBIA: 3♂♂ Hedley, 5 mi. S., 24.vii.1985 (Finnamore & Thormin); [PMAE]; SASKATCHEWAN: 3♂♂ Melfort, 25.viii.1950 (L.A. Konotopetz); [CNC]; **USA:** COLORADO: 1♀ Ridgway, About N38°9′ W107°45′, 7000 ft., 10.vii.1919; [AMNH]; 1♀ Florissant, 19.vi (Cockerell); [BMNH]; 1♀ Florissant, Exped. 1906, 1.vi.1907 (S.A. Rohwer); [ANSP]; 8♀♀ 93♂♂ Teller Co., 7 m N Woodland Pk., South Meadows Camp, 8000 ft., 21–28.vii.1977 (S. Peck); [CNC]; 1♀ Gunnison Co., Almont, 24.vii.1983 (G.C. Eickwort); 10♂♂ Gunnison Co., Almont, 26.vii.1988 (G.C. Eickwort); [CUIC]; 1♀ Florissant, Exped. 1906, 2.vi.1907 (S.A. Rohwer); 1♀ Florissant, Exped. 1906, 16.vi.1907 (S.A. Rohwer); [INHS]; 1♀ Florissant, Exped. 1906, 1.vi.1907 (S.A. Rohwer); [NMNH]; ILLINOIS: 1♀ Carlinville (C. Robertson); [CUIC]; NEW MEXICO: 1♀ Trout Springs, 27.iv (Cockerell); [CUIC]; NORTH DAKOTA: 1♀ Medora, 19.v.1919 (C.H. Waldron); [CUIC]; 2♀♀ Medora, 19.v.1919 (C.H. Waldron); [NMNH]; WYOMING: 30♀♀ Laramie, 30.v.1968 (D.W. Ribble); [INHS].

Floral records. ASCLEPIADACEAE: *Asclepias speciosa*; ASTERACEAE: *Nothocalais cuspidata*, *Taraxacum*; FABACEAE: *Amorpha canescens*, *Glycine max*; POLYGONACEAE: *Eriogonum annuum*; SALICACEAE: *Salix brachycarpa*, *S. cordata*.

Comments. Uncommon. Rarely collected east of the Mississippi.

The name *L. sandhouseae* is a replacement for *Halictus* (*Chloralictus*) *occultus* Sandhouse (1924), which is preoccupied by *Halictus occultus* Vachal (1904) (now *L.* (*Evylaeus*) *occultum*). The epithet *sandhouseae* has been incorrectly associated with *L. rufulipes* in the past (Knerer & Atwood 1964). Gibbs (2010b) placed this species in the subgenus *Evylaeus* (see comments for *L. rufulipes* above).

***Lasioglossum* (*Dialictus*) *timothyi* Gibbs**

Lasioglossum (*Dialictus*) *timothyi* Gibbs, 2010: 333. ♀♂.

Holotype. ♀ CANADA, Ontario, Norfolk Co., Turkey Point Provincial Park, N42°42.227′ W080°19.877′, 7–20.vi.2006 (A. Taylor); [PCYU].

Diagnosis. Female *L. timothyi* can be recognised by the following diagnostic combination: head wide (length/width ratio = 0.90–0.93); supraclypeal area noticeably convex; mesoscutal punctation sparse between parapsidal lines (i=1–3d); mesepisternum weakly rugose; propodeum with dorsolateral slope rugose, oblique carina strong (Fig. 25A); T1 acarinarial fan without dorsal opening; and brown metasomal terga, apical impressed areas distinctly punctate. They are similar to *L. versatum*, *L. smilacinae*, *L. cressonii*, and *L. ceanothi*. Female *L. versatum* have weak oblique carinae and T1 acarinarial fan open dorsally. Female *L. smilacinae* have mesepisternum rugulose with distinct punctures ventrally. Female *L. cressonii* have very strongly rugose mesepisternum and coarse mesoscutal punctures. Female *L. ceanothi* have weak oblique propodeal carinae and moderately dense mesoscutal punctures (i=1–1.5d).

Male *L. timothyi* can be recognised by the relatively head long (length/width = 0.98); facial tomentum dense only on lower paraocular area; flagellomeres relatively long (length/width ratio = 1.54–1.71); mesoscutum polished due to weak microsculpture, punctures sparse between parapsidal lines (i=1–3d); mesepisternum rugose to strongly reticulate-punctate; lateral surface of propodeum rugose; metasomal terga brown, apical impressed areas distinctly punctate; and metasomal sterna with sparse pubescence. They are similar to *L. cressonii*, which has mesepisternum coarsely rugose.

Range. Manitoba, Ontario east to Maine, south to North Carolina. **USA**: IL, IN, MA, ME, MI, NC, NY, SD, WI, WV. **CANADA**: MB, NB, NS, ON.

DNA Barcode. Available. Multiple sequences.

Comments. See Gibbs (2010).

Lasioglossum (*Dialictus*) *trigeminum* Gibbs, new species

(Figures 218–222)

Holotype. ♀ USA, Indiana, Jackson Co., N38.8799 W086.056, 26.vii.2003 (S.W. Droege); [PCYU].

Diagnosis. Female *L. trigeminum* can be recognised by the following diagnostic combination: head wide (length/width ratio = 0.93–0.94) (Fig. 218B); paraocular area with moderately dense tomentum; protrochanter narrow; mesoscutum polished posteriorly, punctures moderately sparse between parapsidal lines (i=1–1.5d) (Fig. 219); mesepisternum rugulose; metapostnotal rugae nearly reaching posterior margin; T1 declivitous surface polished, acarinarial fan with wide dorsal opening; and metasomal terga brown, apical impressed areas densely punctate.

Male *L. trigeminum* can be recognised by the following diagnostic combination: face with dense tomentum (Fig. 220B); flagellomeres long (length/width ratio = 1.46–1.81) (Fig. 220); mesoscutum polished-weakly imbricate, punctures moderately sparse between parapsidal lines (i=1–1.5d) (Fig. 221); tegula and tarsi brownish yellow; metapostnotum with weakly angled onto posterior propodeal surface; metasoma terga with sparse basolateral tomentum; and T2 apical impressed area with narrow impunctate margin. They are most similar to *L. callidum* and *L. versatum*. Male *L. callidum* have wide protrochanter (Fig. 18B). Male *L. versatum* have less dense facial tomentum and denser punctures on T2.

Description. FEMALE. Length 4.84–5.81 mm; head length 1.42–1.58 mm; head width 1.51–1.70 mm; forewing length 3.57–3.93 mm.

Colouration. Head and mesosoma pale green or blue. Clypeus with apical half blackish brown. Antenna dark brown, flagellum with ventral surface yellow-orange. Tegula amber to brownish yellow. Wing membrane subhyaline, venation and pterostigma yellowish brown. Legs brown; tarsi reddish brown. Metasoma dark brown, terga and sterna with apical margins translucent brownish yellow.

Pubescence. Dull white. Moderately dense. Head and mesosoma with moderately dense woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Lower paraocular area and gena with moderately dense subappressed tomentum. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (2–2.5 OD). Metasomal terga with moderately sparse, fine hairs. T1 acarinarial fan sparse with wide dorsal opening, intermingled with erect hairs. T2 basolaterally, T3 and T4 largely covered by tomentum, obscuring surface. T2 apicolateral and T3–T4 apical margins with sparse fringes.

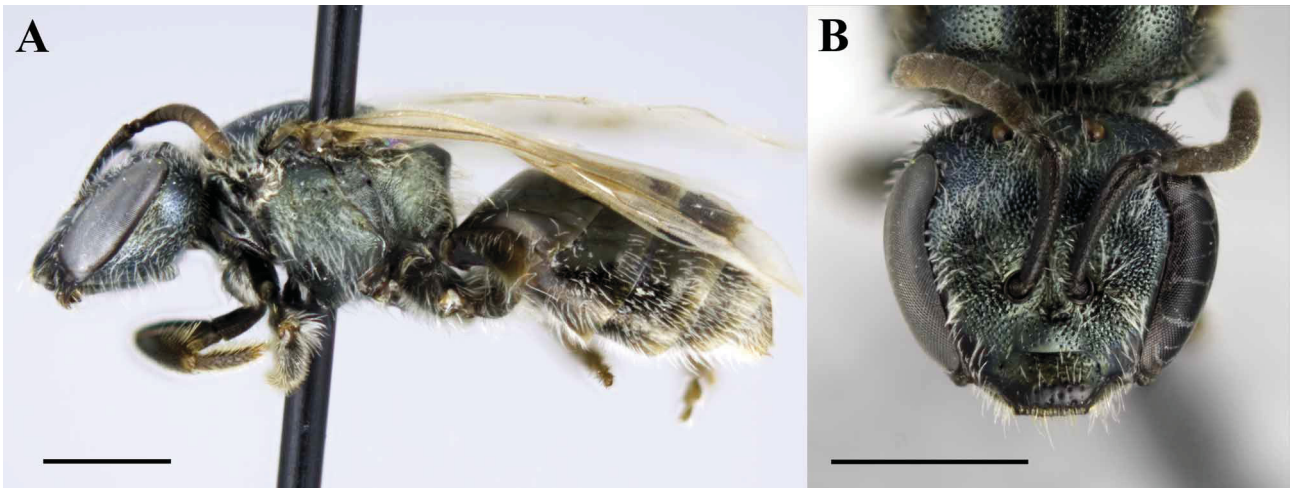

FIGURE 218. *Lasioglossum trigeminum* Gibbs female, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 219. *Lasioglossum trigeminum* Gibbs female, dorsal view of mesosoma.

Surface sculpture. Face imbricate. Clypeus polished, basal margin weakly imbricate, punctation moderately sparse (i=1–2d). Supraclypeal area with punctation moderately sparse (i=1–2d). Lower paraocular area punctation dense (i≤d). Antennocular area punctation moderately dense (i=1–1.5d). Upper paraocular area and frons punctate-reticulate. Ocellocular area densely punctate (i≤d). Gena lineolate. Postgena weakly imbricate. Mesoscutum polished, weakly imbricate in part, punctation moderately sparse on medial portion of disc (i=1–1.5d), dense adjacent to parapsidal lines (laterad and mesad) (i≤d) and reticulate on anterolateral portion. Mesoscutellum similar to mesoscutum, submedial punctation moderately sparse (i=1–2.5d). Axilla punctate. Metanotum imbricate. Preëpisternum rugulose. Hypoepimeral area imbricate.

Mesepisternum upper portion weakly rugulose and lower portion imbricate. Metepisternum with upper half rugoso-carinulate, lower half imbricate. Metapostnotum incompletely rugoso-carinulate, posterior margin imbricate. Propodeum with dorsolateral slope imbricate. Lateral and posterior surfaces imbricate-tessellate. Metasomal terga polished, punctation fine and moderately dense throughout (i=1–1.5d).

FIGURE 220. *Lasioglossum trigeminum* Gibbs male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 221. *Lasioglossum trigeminum* Gibbs male, dorsal view of mesosoma.

Structure. Head very wide (length/width ratio = 0.93–0.94). Eyes convergent below (UOD/LOD ratio = 1.24–1.32). Clypeus 1/3 below suborbital tangent, apicolateral margins convergent. Antennal sockets close (IAD/OAD < 0.5). Frontal line carinate, ending <2OD below median ocellus. Gena narrower than eye. Mesoscutum between parapsidal lines flattened. Inner metatibial spur pectinate with 4–6 branches. Metapostnotum moderately truncate (MMR ratio = 1.27–

1.45), posterior margin narrowly rounded onto posterior surface. Propodeum with oblique carina weak, virtually absent, lateral carina not reaching dorsal margin.

MALE. Similar to female except for the usual secondary sexual characters and as follows. Length 4.90 mm; head length 1.51 mm; head width 1.46 mm; forewing length 3.45 mm.

Colouration. Labrum and mandible infused with yellowish brown. Flagellum with ventral surface brownish yellow. Legs brown, except tibiae bases and apices, and tarsi pale brownish yellow.

Pubescence. Face below eye emargination with tomentum partially obscuring surface, denser on paraocular area. T2–T4 with sparse basolateral tomentum. S3–S5 apicolateral portions with subappressed hairs (1–1.5 OD).

Surface sculpture. Propodeum with dorsolateral slope and posterior propodeal surface rugose. Metasomal terga with apical impressed areas punctate, but narrowly impunctate apically.

Structure. Head round (length/width ratio = 1.02). Eyes strongly convergent below (UOD/LOD ratio = 1.54). Clypeus 2/3 below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets distant (IAD/OAD > 1.3). Frontal line carinate, ending 2 OD below median ocellus. Pedicel shorter than F1. F2 length 2.0X F1. F2–F10 moderately elongate (length/width ratio = 1.46–1.81). Metapostnotum moderately elongate (MMR ratio = 1.27), posterior margin narrowly rounded onto posterior surface.

Terminalia. S7 with median lobe columnar, apex rounded (Fig. 222). S8 with apicomedial margin weakly convex (Fig. 222). Genital capsule as in Fig. 222. Gonobase with ventral rim narrowly separated. Volsella roughly ovoid. Gonostylus small, dorsal setae elongate. Retrorse lobe elongate, weakly attenuated, recurved apically.

Range. Maryland south to Georgia, west to Kansas (Fig. 223). **USA**: DC, FL, GA, IL, IN, KS, MD, MI, NC, NJ, SC, VA, WV.

Allotype. ♂. **USA:** GEORGIA, Chatham Co., N32.1323 W081.1336, 22.x.2009 (C. Haynes); [PCYU].

Paratypes. USA: FLORIDA: 1♀ Leon Co., Tall Timbers Res. Sta., 28.iii.1986 (B. Alexander); DISTRICT OF COLUMBIA: 1♀ N76.95472 W038.905, 26.v.2005 (S. Rudy); [PCYU]; ILLINOIS: 1♀ Carlinville, N39.2787 W089.8898, 24.vi.2006 (J. Gibbs); [PCYU]; KANSAS: 1♀ Douglas Co., Lawrence, from nest, vii.1957 (C.D. Michener); 1♀ Lawrence, 3.vii.1952 (C.D. Michener); 2♀♀ Lawrence, 8.vi.1952 (C.D. Michener); 1♀ Lawrence, 2.viii.1952 (C.D. Michener); [SEMC]; MARYLAND: 1♀ Anne Arundel Co., N39.08223 W076.7883, 14–15.vi.2005 (P. Osenton); 1♀ Pr. George's Co., N38.978 W076.7643, 8–9.ix.2005 (Z. Riegel); [PCYU]; MICHIGAN: 1♀ Wakefield, 13.ix.1913 (A.T. Evans); [UCMC]; NORTH CAROLINA: 1♀ E. of Charlotte, Hwy 24/27, N35.22754 W080.5583, 10.viii.2006 (J. Gibbs); 1♀ S. of Bryson City, Bryson City & Queen Branch Rds., N35.28377 W083.4872, 8.viii.2006 (J. Gibbs); 1♀ Richmond Co., N36.8628 W079.83642, 19.v.2006 (S.W. Droege); 1♀ Richmond Co., N36.8937 W079.81004, 19.v.2006 (S.W. Droege); [PCYU]; SOUTH CAROLINA: 1♀ Chesterfield Co., N34.5403 W080.23182, 18.v.2006 (S.W. Droege); [PCYU]; VIRGINIA: 1♀ Assateague I., N37.9144 W075.3379, 30.vi–1.vii.2006 (S.W. Droege); [PCYU]; WEST VIRGINIA: 1♀ Hampshire Co., N39.30325 W078.4339, 29–30.v.2004 (S.W. Droege); [PCYU].

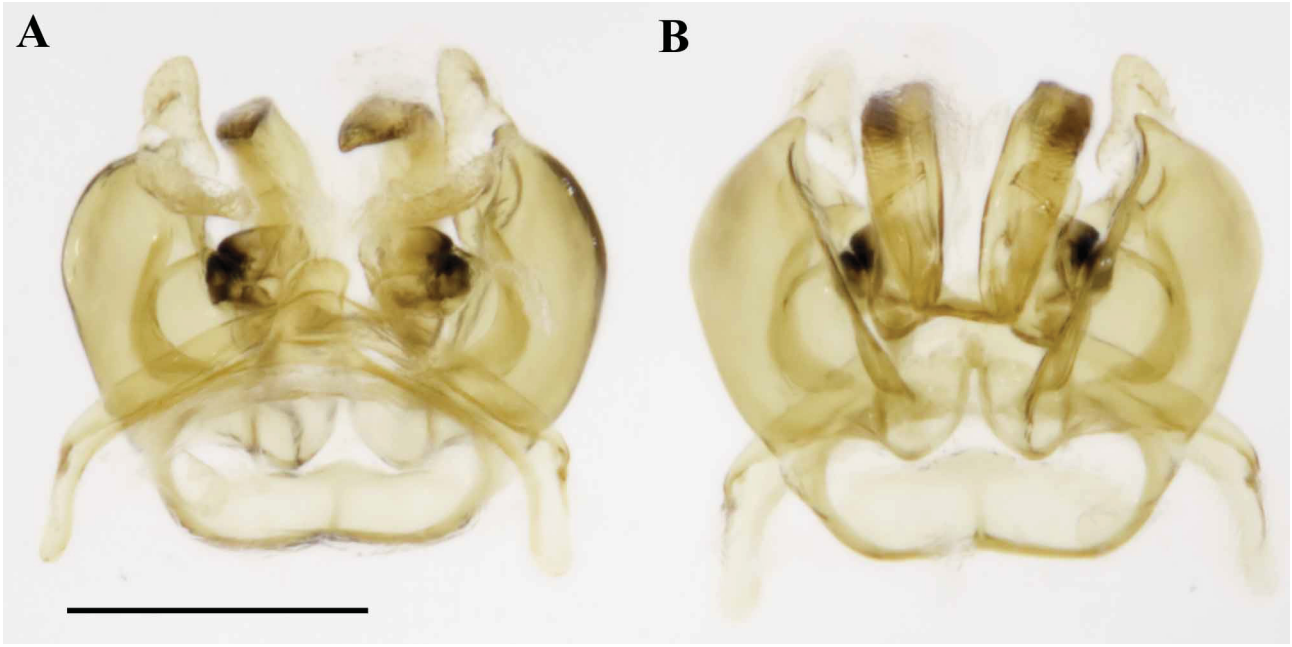

FIGURE 222. *Lasioglossum trigeminum* Gibbs, new species male terminalia, (A) ventral view, (B) dorsal view. Scale bar = 0.5 mm.

FIGURE 223. Distribution map of *Lasioglossum trigeminum* (circles) and *L. wheeleri* (star).

Etymology. The specific epithet is taken from Latin word for 'triplet' and refers to the close similarity of this species with *L. versatum* and *L. callidum*.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Examination of voucher material from the behavioural studies performed by Michener (1966) revealed that at least some of the bees he studied correspond to *L. trigeminum* and not *L. versatum*. The latter name has been regularly applied to three distinct but closely related species (Gibbs 2010b, see discussion below).

Lasioglossum (*Dialictus*) *versans* (Lovell)

Halictus versans Lovell, 1905a: 39. ♀ (♂ misdet.).

Lectotype. ♀ USA, Maine, Waldoboro (J.H. Lovell); [NMNH: 71573] designated herein. Examined.

Halictus (*Chloralictus*) *consonus* Sandhouse, 1924: 30. ♂.

Holotype. ♂ USA, Connecticut, Colebrook, 1–7.ix, (W.M. Wheeler); [NMNH: 26429]. Examined.

Halictus (*Chloralictus*) *brevibasis* Cockerell, 1938a: 3. ♂.

Holotype. ♂ CANADA, Saskatchewan, Lake Waskesiu, beginning of portage to Heart Lakes, 31.viii.1936 (T. & W. Cockerell); [AMNH]. Examined.

Evylaeus divergenoides Mitchell, 1960: 351. ♂. **[new synonymy]**

Holotype. ♂USA, Michigan, Mackinac Co., St. Ignace, 23.vii.1921 (T.H. Hubbell); [NMNH: 75204]. Examined

Taxonomy. Lovell, 1908: *Halictus versans* ♂, p. 38 (description); Michener, 1951: *Lasioglossum* (*Chloralictus*) *brevibase*, p. 1112, *L.* (*C.*) *consonum*, p. 1113, *L.* (*C.*) *versans*, p. 1118 (catalogue); Krombein, 1958: *Lasioglossum* (*Chloralictus*) *brevibase*, p. 230 (catalogue); Mitchell, 1960: *Dialictus versans* ♀♂, p. 427 (redescription, synonymy); Krombein, 1967: *Lasioglossum* (*Dialictus*) *versans*, p. 466 (catalogue); Hurd, 1979: *Dialictus brevibasis*, p. 1964, *D. versans*, p. 1972 (catalogue); Moure & Hurd, 1987: *Dialictus versans*, p. 137, *D. brevibasis*, p. 92 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *versans* ♀♂, p. 337 (redescription, key, synonymy).

Diagnosis. Female *L. versans* can be recognised by the following diagnostic combination: metapostnotal rugae extending less than 2/3 distance to posterior margin, posterior margin distinctly extending beyond adjacent dorsal surface of propodeum; T1 declivitous surface with sparse erect pubescence but no acarinarial fan (Fig. 9B); and apical impressed areas of metasomal terga impunctate. They are most similar to *L. hemimelas*, which has metapostnotal rugae reaching or nearly reaching the posterior margin (Fig. 133).

Male *L. versans* can be recognised by the following diagnostic combination: metapostnotal rugae reaching 2/3 distance to posterior margin, and penis valve with large dorsal crest.

Range. Nova Scotia, Prince Edward Island, west to Alberta, south to North Carolina. **USA**: CO, CT, IL, MA, MD, ME, MI, MN, NC, NH, NY, PA, SD, TN, VA, VT, WI. **CANADA**: AB, MB, NB, NS, ON, PE, SK.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

To maintain stable usage of the name, the specimen indicated above is designated as the lectotype. The name-bearing type has lectotype labels from both Mitchell and Covell. No publication by either of these authors could be found that makes a valid lectotype designation.

Lasioglossum (*Dialictus*) *versatum* (Robertson)

Chloralictus versatus Robertson, 1902b: 249. ♀ ♂.

Lectotype. ♀ USA, Illinois, Macoupin Co., Carlinville, 8.iv.1886 (C. Robertson); [INHS: 543] by W. E. LaBerge (in Webb 1980). Examined.

Halictus subconnexus rohweri Ellis, 1915: 292. ♀.

Lectotype. ♀ USA, Virginia, Fairfax Co., Newington, 30.v.1911 (S.A. Rohwer) [UCMC] designated herein. Examined.

Halictus (*Chloralictus*) *apertus* Sandhouse, 1924: 35. ♂.

Holotype. ♂ USA, Virginia, Chain Bridge, 14.vi., (S.A. Rohwer); [NMNH: 26437]. Examined.

Halictus (*Chloralictus*) *genuinus* Sandhouse, 1924: 36. ♂.

Holotype. ♂ USA, Virginia, Chain Bridge, 14.vi., (S.A. Rohwer); [NMNH: 26438]. Examined.

Halictus (*Chloralictus*) *geminus* Bohart, 1941: 138. *Lapsus calami*.

Taxonomy. Viereck, 1916: *Halictus* (*Chloralictus*) *versatus*, p. 707 (key); Michener, 1951: *Lasioglossum* (*Chloralictus*) *apertum*, p. 1112, *L.* (*C.*) *genuinum*, p. 1113, *L.* (*C.*) *rohweri*, p. 1117, *L.* (*C.*) *versatum*, p. 1118 (catalogue); Mitchell, 1960: *Dialictus apertus* ♂, p. 380, *D. genuinus* ♂, p. 394, *D. laevissimum* ♂ (misdet.), p. 401, *L. rohweri* ♀, p. 418 (redescription); Knerer and Atwood, 1962a: *D. rohweri* ♂, p. 1230 (description); Krombein, 1967: *Lasioglossum* (*Dialictus*) *rohweri*, p. 466, *L.* (*D.*) *versatum*, p. 466, (catalogue); *Dialictus apertus*, p. 1964, *D. genuinus*, p. 1966, *D. rohweri*, p. 1971, *D. versatus*, p. 1972 (catalogue); Moure & Hurd, 1987: *Dialictus apertus*, p. 89, *D. genuinus*, p. 101, *D. rohweri*, p. 127, *D. versatus*, p. 137 (catalogue); Pesenko *et al*., 2000: *Evylaeus rohweri*, p. 52, *E. versatus*, p. 54 (review); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *versatum* ♀♂, p. 342 (redescription, key, synonymy).

Diagnosis. Female *L. versatum* can be recognised by the following diagnostic combination: size large (5.1–6.8 mm); head wide (length/width ratio = 0.89–0.94); mandible with dorsal margin straight; clypeus 1/3–1/2 below suborbital line; mesoscutum tessellate, punctures moderately sparse punctures between parapsidal lines (i=1.5–3d), centre appearing flat; mesepisternum rugulose; tegula usually reddish brown; protrochanter unmodified; metapostnotum completely rugoso-

carinulate; T1 acarinarial fan with wide dorsal opening; and metasomal terga brown, apical impressed areas densely punctate. They are most similar to *L. callidum*, which has protrochanter very wide (Fig. 18B), mandible strongly curved at midlength of dorsal margin (Fig. 19B), and clypeus not much protruding below suborbital line.

Male *L. versatum* are similar to females but can be further recognised by the following combination: head round (length/width ratio = 1.00–1.01); face with dense tomentum; flagellomeres moderately long (length/width ratio = 1.43–1.60), brownish yellow ventrally; metabasitarsus four times as long as broad; and apical impressed areas of metasomal terga punctate. Similar species include *L. dubitatum*, *L. callidum*, *L. laevissimum* and *L. mitchelli*. Male *L. dubitatum* have a short and wide metabasitarsus approximately three times as long as broad. Male *L. callidum* have wide protrochanter. Male *L. laevissimum* and *L. mitchelli* have apical impressed areas of metasomal terga impunctate.

Range. Quebec, south to North Carolina, west to Manitoba, Kansas (Fig. 231). **USA**: AR, CT, DE, IL, IN, KS, MA, MD, ME, MO, NC, NY, PA, TN, VA, WI. **CANADA**: MB, ON, PQ.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

The lectotype of *L. versatum* does not match the species that was most commonly referred to by this name in the literature prior to Gibbs (2010b). Mitchell (1960) used this name (as *Dialictus versatus*) to refer to what is here called *L. callidum*. The behavioural study of *L. versatum* by Michener (1966) apparently was at least in part a study of *L. trigeminum* (see above).

Despite the common use of the specific epithet *rohweri* in earlier literature, the location of the type series of *Halictus subconnexus rohweri* was not clear (Moure & Hurd 1987; Gibbs 2010b). Ellis (1915) based her original description on two specimens from Newington, Virginia. A specimen with matching locality information to that given in the description, with a handwritten label by Ellis reading "*Halictus subconnexus rohweri* Ellis", was found at UCMC. It is here designated as the lectotype to fix the commonly used epithet *rohweri* to a physical specimen and thus clarify the application of the name. A lectotype label has been affixed to the specimen. The identity of the lectotype agrees with common usage of the name.

Lasioglossum (*Dialictus*) *vierecki* (Crawford)

Halictus vierecki Crawford, 1904: 97. ♀.

Holotype. ♀ USA, New Jersey, Clementon, 6.vi.1830 [ANSP: 10206]. Examined. [specimen missing head]

Taxonomy. Graenicher, 1910: *Halictus vierecki* ♂, p. 158 (description); Viereck, 1916: *Halictus* (*Chloralictus*) *vierecki*, p. 707; Michener, 1951: *Lasioglossum* (*Chloralictus*) *vierecki*, p. 1118 (catalogue); Mitchell, 1960: *Dialictus vierecki* ♀♂, p. 429 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *vierecki*, p. 466 (catalogue); *Dialictus vierecki*, p. 1973 (catalogue); Moure & Hurd, 1987: *Dialictus vierecki*, p. 139 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *vierecki* ♀♂, p. 346 (redescription, key).

Diagnosis. Female *L. vierecki* can be recognised by the following diagnostic combination: metasoma pale, brownish yellow; head, mesosoma (Fig. 29B), and metasomal terga largely obscured by dense, yellowish tomentum; apical half of clypeus brownish yellow; and legs extensively brownish yellow.

Male *L. vierecki* can be recognised by the following diagnostic combination: size small (2.9–4.9 mm), mesoscutal punctures dense (i<d), mesepisternal punctures distinct, metasomal terga reddish brown, and basal portions of T2–T3 distinctly impressed.

Range. Manitoba and Ontario south to Texas and Florida. **USA**: FL, IN, MA, MD, MI, MN, NC, NE, NJ, NY, RI, SC, TX, WI. **CANADA**: MB, ON, PQ.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Lasioglossum vierecki evidently has a preference for nesting in sandy soils. This species is believed to be solitary (Knerer 1969; Packer 1993).

Lasioglossum (*Dialictus*) *viridatum* (Lovell)

Halictus viridatus Lovell, 1905b: 300. ♀ ♂.

Lectotype. ♀ USA, Maine, Waldoboro, vi, [NMNH: 71574] designated herein. Examined.

Dialictus lepidus Mitchell, 1960: 438. ♂.

Holotype. ♂ USA, Michigan, Keweenaw Co., 27.viii.[year obscured] (R.R. Dreisbach); [NCSU]. Examined.

Taxonomy. Michener, 1951: *Lasioglossum* (*Chloralictus*) *viridatum*, p. 1118 (catalogue); Mitchell, 1960: *Dialictus viridatus* ♀, p. 430 (redescription); Mitchell, 1962: *Dialictus viridatus*, p. 547 (synonymy); Krombein, 1967: *Lasioglossum* (*Dialictus*) *viridatum*, p. 466 (catalogue); *Dialictus viridatus*, p. 1973 (catalogue); Moure & Hurd, 1987: *Dialictus viridatus*, p. 139 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *viridatum* ♀♂, p. 351 (redescription, key).

Diagnosis. Female *L. viridatum* can be recognised by the following diagnostic combination: head wide (length/width ratio = 0.94–0.96); mesoscutum imbricate, punctures moderately coarse, relatively sparse between parapsidal lines (i=1–2d); tegula reddish brown; mesepisternum strongly rugose (Fig. 17A); metapostnotum rugoso-carinulate reaching the posterior margin; T1 acarinarial fan with dorsal opening; metasomal terga brown, apical halves obscurely punctate; and T4 with sparse tomentum, partially obscuring surface. They are most similar to *L. atwoodi*, which has metapostnotal rugae almost but not reaching the posterior margin and T4 with only scattered tomentum, not obscuring surface.

Male *L. viridatum* are similar to females but may be further distinguished by head relatively long (length/width ratio = 1.01–1.02), flagellomeres long (length/width ratio = 1.56–1.64), mesoscutum reticulate anterolaterally, tarsi brownish yellow, apical impressed areas of metasomal terga impunctate, and apicolateral portions of S3–S5 with moderately dense plumose hairs.

Range. Nova Scotia west to Manitoba, south to North Carolina. **USA**: CT, IN, MA, ME, MI, MN, NC, NH, NY, WI. **CANADA**: MB, NB, NS, ON, PE.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

The name-bearing type has lectotype labels from both Mitchell and Covell. No publication by either of these authors could be found that makes a valid lectotype designation. To maintain stable usage of the name, the specimen indicated above is designated as the lectotype.

Lasioglossum (*Dialictus*) *weemsi* (Mitchell)

Dialictus weemsi Mitchell, 1960: 431. ♀.

Holotype. ♀ USA, North Carolina, Wake Co., 16.vi.1955 on *Melilotus officinalis* (H.V. Weems, Jr.); [FSCA]. Examined.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *weemsi*, p. 467 (catalogue); *Dialictus weemsi*, p. 1973 (catalogue); Moure & Hurd, 1987: *Dialictus weemsi*, p. 140 (catalogue); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *weemsi* ♀, p. 355 (redescription, key).

Diagnosis. Female *L. weemsi* can be recognised by the shape of the clypeus, which has the distal margin beyond the preapical fimbriae extending laterally making it noticeably wider than the preapical margin (Figs. 21B). The distal portion of the clypeus has a rectangular appearance as a result. They may be further distinguished by the following combination: head wide (length/width ratio = 0.93–0.96); mesoscutum weakly tessellate, punctures moderately dense between parapsidal lines (i=1–2d); mesepisternum rugulose; tegula pale; tibiae mostly brown; and T1 acarinarial fan with dorsal opening. They are most similar to *L. mitchelli* and *L. weemsi*, both of which have a similarly shaped clypeus. Female *L. mitchelli* do not have a dorsal opening on the T1 acarinarial fan (or the opening is very narrow). Female *L. leviense* have extensive pale colouration on legs and slightly narrower heads (length/width ratio = 0.95–0.97).

Range. Southern Ontario south to Georgia. **USA**: GA, IL, KS, MA, MD, NC, NJ, NY, PA, SC, TN, VA, WI, WV. **CANADA**: ON.

DNA Barcode. Available.

Comments. Common.

Lasioglossum (*Dialictus*) *wheeleri* (Mitchell)

(Figures 224–226)

Dialictus wheeleri Mitchell, 1960: 445. ♂.

Holotype. ♀ USA, Massachusetts, Forest Hills, 29–30.viii.1922 [NCSU]. Examined.

Taxonomy. Krombein, 1967: *Lasioglossum* (*Dialictus*) *wheeleri*, p. 467 (catalogue); Moure and Hurd, 1987: *Dialictus wheeleri*, p. 140 (catalogue).

Diagnosis. Male *L. wheeleri* can be recognised by the following diagnostic combination: head round (length/width ratio = 0.98) (Fig. 224B), pronotal angle orthogonal (225), mesepisternal punctures distinct, and S7 apical lobe clavate with truncate apex. They are most similar to *L. heterognathum*, which has the pronotal angle obtuse.

Female unknown.

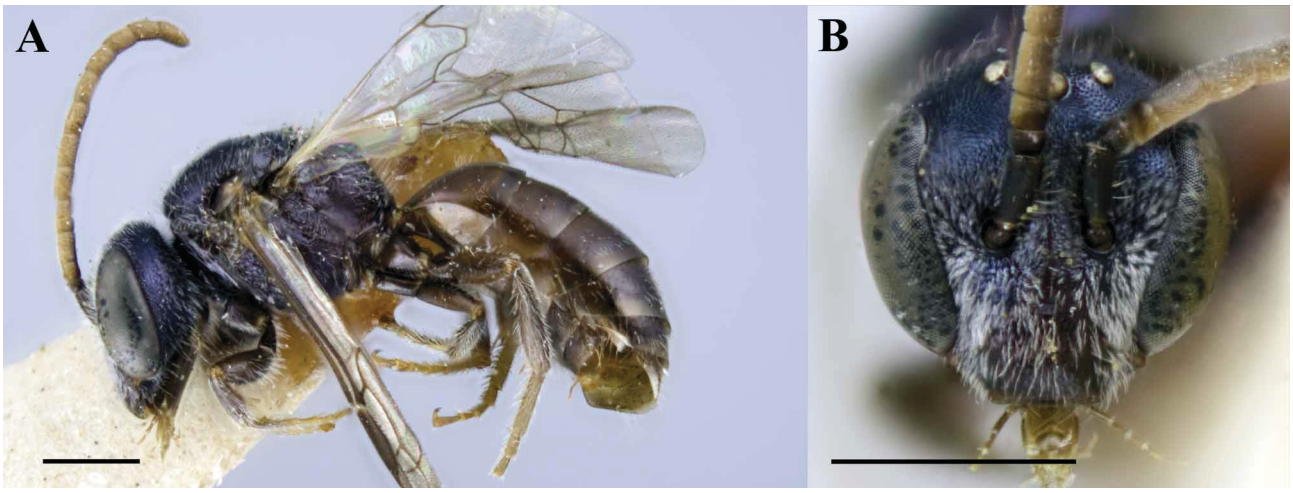

FIGURE 224. *Lasioglossum wheeleri* (Mitchell) male, (A) lateral habitus, (B) face. Scale bars = 1 mm.

FIGURE 225. *Lasioglossum wheeleri* (Mitchell) male, dorsal view of mesosoma.

Redescription. FEMALE. Length 4.72 mm; head length 1.51 mm; head width 1.54 mm; forewing length 3.87 mm

Colouration. Head and mesosoma purplish blue. Antenna dark brown, flagellum with ventral surface brownish yellow. Tegula dark amber. Wing membrane faintly dusky, venation and stigma brown. Legs brown, except tarsi dull brownish yellow. Metasoma brown, terga and sterna with apical margins translucent brownish yellow.

Pubescence. Dull white. Sparse throughout. Head and mesosoma with moderately sparse woolly hairs (1–1.5 OD), longest on genal beard, metanotum, and mesopleuron (2–2.5 OD). Clypeus and supraclypeal area with scattered squamose hairs, not obscuring surface. Paraocular area below eye emargination with subappressed tomentum, obscuring lower paraocular area. Propodeum with moderately dense plumose hairs on lateral and posterior surfaces (1–2 OD). Metasomal terga with sparse, fine hairs but no tomentum. S2–S5 with sparse erect hairs (1–2 OD).

Surface sculpture. Face polished, weakly imbricate, punctation fine. Clypeus an supraclypeal area punctation moderately dense (i=1–1.5d). Lower paraocular and antennocular areas with punctation dense (i≤d). Upper paraocular area and frons punctate-reticulate. Ocellocular area punctate (i=1–1.5). Gena weakly lineolate. Postgena weakly imbricate. Mesoscutum polished, punctation sparse between parapsidal lines (i=1–2d), relatively dense laterad of parapsidal line (i=1–1.5d) and dense on anterolateral portion (i≤d). Mesoscutellum polished, submedial punctation sparse (i=1–3d). Axilla punctate. Metanotum rugose. Preëpisternum rugose. Hypoepimeral area imbricate-punctate. Mesepisternum polished, punctate (i=1–2d). Metepisternum dorsal 2/3 rugoso-carinulate, ventral portion imbricate. Metapostnotum rugoso-carinulate, rugae reaching posterior margin. Propodeum with dorsolateral slope rugose, lateral and posterior surfaces polished. Metasomal terga polished except apical impressed areas faintly coriarious, punctation fine (i=1–1.5d), apical impressed areas impunctate.

Structure. Head round (length/width ratio = 0.98). Eyes strongly convergent below (UOD/LOD ratio = 1.40). Labrum short, wide without apical process. Mandible reaching opposing clypeal angle, preapical tooth absent. Clypeus 1/2 below suborbital tangent, apicolateral margins weakly convergent. Antennal sockets distant (IAD/OAD > 1.5). Frontal line carinate, ending 2 OD below median ocellus. IOD greater than OOD. Pedicel shorter than F1. F2 length 1.8X F1. F2–F10 moderately elongate (length/width ratio = 1.67–1.77). Gena narrower than eye. Hypostomal carinae subparallel. Pronotal dorsolateral angle orthogonal. Pronotal ridge carinate, weakly interrupted by sulcus. Metapostnotum truncate (MMR ratio = 1.29), posterior margin narrowly rounded onto posterior surface. Propodeum with lateral carina short, not reaching dorsal margin.

Terminalia. S7 with median lobe clavate, apex truncate, flat (Fig. 226). S8 with apicomedial margin weakly convex (Fig. 226). Genital capsule as in Fig. 226. Gonobase with ventral arms narrowly separated. Gonostylus small, dorsal setae elongate. Retrorse lobe narrow, weakly attenuated apically.

FIGURE 226. *Lasioglossum wheeleri* (Mitchell) male terminalia, ventral view. Scale bar = 0.5 mm.

Range. Massachusetts, topotypical (Fig. 223).

DNA Barcode. Unavailable.

Comments. Rare (only known from the holotype).

Lasioglossum wheeleri may be a socially parasitic species. The combination of a wide head and carinate pronotal ridge is typical of parasitic *Lasioglossum*. If *L. wheeleri* is a parasite, then *L. ascheri* and *L. curculum*, described above, are candidates for the female of this species.

Lasioglossum (*Dialictus*) *zephyrum* (Smith)

Halictus zephyrus Smith, 1853: 68. ♂.

Holotype. ♂ USA, Florida, St. John's Bluff [BMNH: B.M. Type 17a 993]. Examined.

Halictus (*Chloralictus*) *academicus* Sandhouse, 1924: 12. ♀.

Holotype. ♀ USA, Colorado, Boulder, 14.v. (I. Bleasdale); [NMNH: 26402]. Examined.

Halictus (*Chloralictus*) *vintonensis* Sandhouse, 1924: 22. ♀.

Holotype. ♀ USA, Iowa, Vinton, 23.vi.1922 (G. Sandhouse); [NMNH: 26417]. Examined.

Taxonomy. Robertson, 1895: *Halictus zephyrus* ♀, p. 117 (description); Robertson, 1902b: *Chloralictus zephyrus*, p. 248 (key); Cockerell, 1905: *Halictus zephyrus* ♂, p. 352 (redescription); Viereck, 1916: *Halictus* (*Chloralictus*) *zephyrus*, p. 706 (key); Michener, 1951: *Lasioglossum* (*Chloralictus*) *academicum*, p. 1111, *L.* (*C.*) *zephyrus*, p. 1118 (catalogue); Mitchell, 1960: *Dialictus zephyrus* ♀♂, p. 431 (redescription); Krombein, 1967: *Lasioglossum* (*Dialictus*) *zephyrum*, p. 467 (catalogue); Hurd, 1979: *Dialictus academicus*, p. 1963 (catalogue); *Dialictus academicus*, p. 1963, *D. zephyrus*, p. 1973 (catalogue); Moure & Hurd, 1987: *Dialictus academicus*, p. 87, *D. zephyrus*, p. 140 (catalogue); Pesenko *et al*., 2000: *Evylaeus zephyrus*, p. 42 (review); Gibbs, 2010b: *Lasioglossum* (*Dialictus*) *zephyrum* ♀♂, p. 362 (redescription, key, synonymy).

Diagnosis. Female *L. zephyrum* can be recognised by the following diagnostic combination: size relatively large (5.31–7.08 mm); head wide (length/width ratio = 0.94–0.95); lower paraocular area with dense tomentum obscuring surface; gena wider than eye; hypostomal carina parallel; mesoscutum polished, punctures fine, moderately sparse between parapsidal lines (i=1–2d); mesepisternal punctures fine, sometimes obscure; metapostnotal rugae reaching approximately halfway to posterior margin; and metasomal terga polished with faint metallic reflections.

Male *L. zephyrum* are similar to females but can be further distinguished by the following combination: clypeus sometimes brownish yellow apically; denser tomentum on paraocular area; flagellomeres long (length/width ratio = 1.75–1.86), bright yellow ventrally; gena narrower than eye; mesepisternal punctures distinct; tarsi, apices and bases of tibiae pale brownish yellow; metapostnotal rugae longer, posterior margin smoothly rounded onto posterior propodeal surface; and metasomal terga colour variable from brown with greenish reflections to orange-red.

Range. Quebec west to Alberta, Oregon, south to Florida, Texas. **USA**: AL, CO, CT, DE, FL, GA, IA, IL, IN, KY, MA, MD, ME, MI, MO, MT, NC, NE, NY, OR, PA, TN, TX, VT, WI, WV. **CANADA**: AB, MB, ON, PQ.

DNA Barcode. Available. Multiple sequences.

Comments. Common.

Lasioglossum zephyrum is a eusocial species (Batra 1966) and is the most thoroughly studied species of *L.* (*Dialictus*) (see Gibbs 2010b for a bibliography).

Discussion

A relatively small number of new species and new synonymies are proposed above in comparison to those made in the revision of *Lasioglossum* (*Dialictus*) in Canada (Gibbs 2010b). Completion of these two studies now makes the *L.* (*Dialictus*) fauna of eastern North America far less challenging than it once was, however, the close similarity of many *L.* (*Dialictus*) species means that these species will always be among the most difficult bees to identify. Several species remain unknown from both sexes. Completion of these two revisions should facilitate additional sex associations in the future.

Numerous faunal lists, biodiversity surveys, and ecological studies of bees have been completed in the eastern USA. It is now possible to revisit these studies to determine the effects of taxonomic changes in such an abundant constituent of the bee fauna. Rough estimates of misidentified individuals of *L.* (*Dialictus*) in previously published studies are typically at least 23% (Packer *et al*. 2009; J. Gibbs unpublished data). Misidentifications have most frequently occurred in the *L.*

viridatum species group, in part due to the number of recently described species, such as *L. ephialtum* and *L. taylorae*. *Lasioglossum abanci*, *L. admirandum*, *L. oblongum* and *L. versatum*, in particular, have often been misidentified.

Many of the distributions reported for species above are clearly incomplete. In some cases only very disjunct populations have been sampled and for other species only a single specimen has been examined. Many additional records of *L.* (*Dialictus*), compiled from numerous collections, are also available from www.discoverlife.org (Ascher & Pickering 2010). Although several species are evidently specialists of particular habitat types (*e.g.* coastal dunes), other species (*e.g.* social parasites) may have much more extensive ranges but are not easily collected. Additional collecting in under sampled areas would improve understanding of species distributions and their conservation status. Collecting fresh material for molecular studies, digging up nests for parasitic species, and increased collecting effort for males in the late summer should provide much of the necessary material for filling in gaps in taxonomic understanding of *L.* (*Dialictus*). Many additional specimens are present in existing collections and once examined may yield new insights into *L.* (*Dialictus*) taxonomy.

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